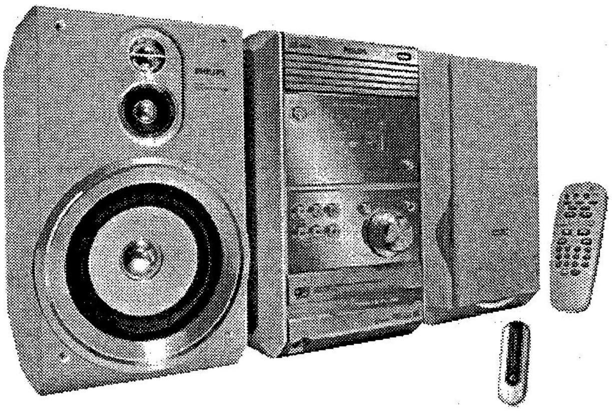
Micro System

MCW770/21/22/37

Service
Service
Service



Service Manual

connectedplanet

ReWritable CD COMPATIBLE

COMPACT disc DIGITAL AUDIO

MP3-CD PLAYBACK MP3

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CLASS 1
LASER PRODUCT

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PHILIPS

TECHNICAL SPECIFICATION

General:

Mains voltage : 230V±10%, 50Hz for /22
127V/240V +10% -15%, 50-60Hz switchable for for /21
120V±10%, 60Hz for /37
Power consumption : ≤ 45W (measured at 1/8 P_{rated})
≤ 10W in Standby
≤ 0,5W in ECO Standby

Input / Output:

Auxiliary / CDR in:
input sensitivity : ≤500mV_{rms}, Aux
≤1000mV_{rms}, CDR
input impedance : 29kΩ

Headphone:
output level : max. 2,5V_{rms} at100Ω
frequency response: 40Hz - 16.000 Hz ±3dB (typ. ±1dB), measured in JAZZ mode
distortion : ≤ 1% (typ. 0,15%) at 1 kHz and -20dB output level at 120Ω
channel difference : ≤ 1dB at 1 kHz
channel crosstalk : ≤ -35dB at 1kHz (typ. -60dB)
signal/noise ratio : ≥ 60dB (A-weighted)

Amplifier:

Power stage protection : shortcircuit and DC

Output power : 2 x 70W_{rms} +0,6dB at 6Ω D=10%
frequency response: 40Hz - 16000Hz ±3dB (typ. ±1dB), measured in JAZZ mode
distortion : ≤ 1% (typ. 0,15%) at 1 kHz and 1W output power
channel difference : ≤ 1dB at 1 kHz and 1W output power
channel crosstalk : ≤ -35dB at 1kHz (typ. -60dB)
signal/noise ratio : ≥ 60dB (A-weighted)

DC on output : ≤ 50mV with no signal on input

Digital Sound Control *DSC*

tolerance: ±3dB	**60Hz**	**1kHz**	**12kHz**
Jazz (flat) :	-1dB	0dB	0dB
Rock :	+18dB	+2,5dB	+8dB
Pop :	+17dB	+2dB	0dB
Optimal :	+9dB	+1dB	+3,5dB

Virtual Environment Control *VEC*

tolerance: ±3dB	**60Hz**	**1kHz**	**12kHz**
Jazz (flat) :	-1dB	0dB	0dB
Cyber :	+6,5dB	+2dB	+5dB
Concert :	+4,5dB	+2dB	+3dB
Cinema :	+7dB	+2dB	+2dB
Hall :	+13dB	+2dB	+1dB

Tuner:

	FM	MW (AM)
tuning range	87,5 - 108 MHz	531 - 1602 kHz (530 - 1700 kHz for /21/37)
IF	10,7 MHz ± 20 kHz	450kHz ± 1 kHz
sensitivity Mono: 26dB S/N, m=30%	≤ 5 µV (2µV typ.)	≤ 4mV/m (2mV/m typ.)
-3 dB limiting point	≤ 5 µV (2µV typ.)	
frequency grid	50 kHz (100 kHz for /37) (50/100 kHz* for /21)	9 kHz (10 kHz for /37) (9/10 kHz* for /21)
	* can be selected via software initialization	
distortion	≤ 3% (≤ 1% typ.) RF=1mV Δf=75kHz	≤ 5% (3% typ.) RF=50mV/m m=80%
image rejection ratio	≥ 25dB (40dB typ.)	≥ 28dB
channel separation at 1kHz	≥ 22dB (27dB typ.)	----

TECHNICAL SPECIFICATION

CD module:

To be measured on COMBI BOARD connector 1015 .

frequency response : 20Hz - 20.000 Hz ±3dB
signal/noise ratio : ≥ 76dB (A-weighted)
distortion : ≤ 0,5% at 1 kHz)
channel difference : ≤ 1dB at 1 kHz
channel crosstalk : ≤ -60dB at 1kHz
de emphasis : 0 or 15/50µs switched automatically by subcode on the disc

laser
  output power : 500µW
  wave length : 780 ±20nm

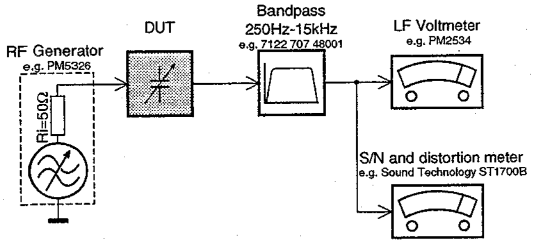
Wireless module „WESSLI":

To be measured on COMBI BOARD connector 1022 .

frequency response : 20 - 20.000 Hz ±3dB
signal/noise ratio : ≥ 94dB (A-weighted)
distortion : ≤ 0,05% at 1 kHz)
channel difference : ≤ 1dB at 1 kHz
channel crosstalk : ≤ -75dB at 1kHz

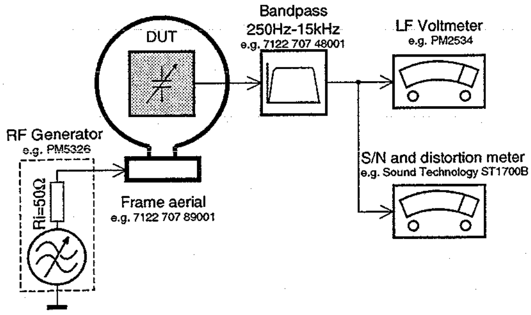
Measurement setup

Tuner FM


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

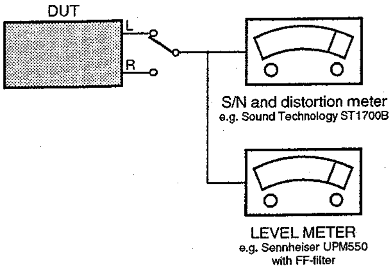
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

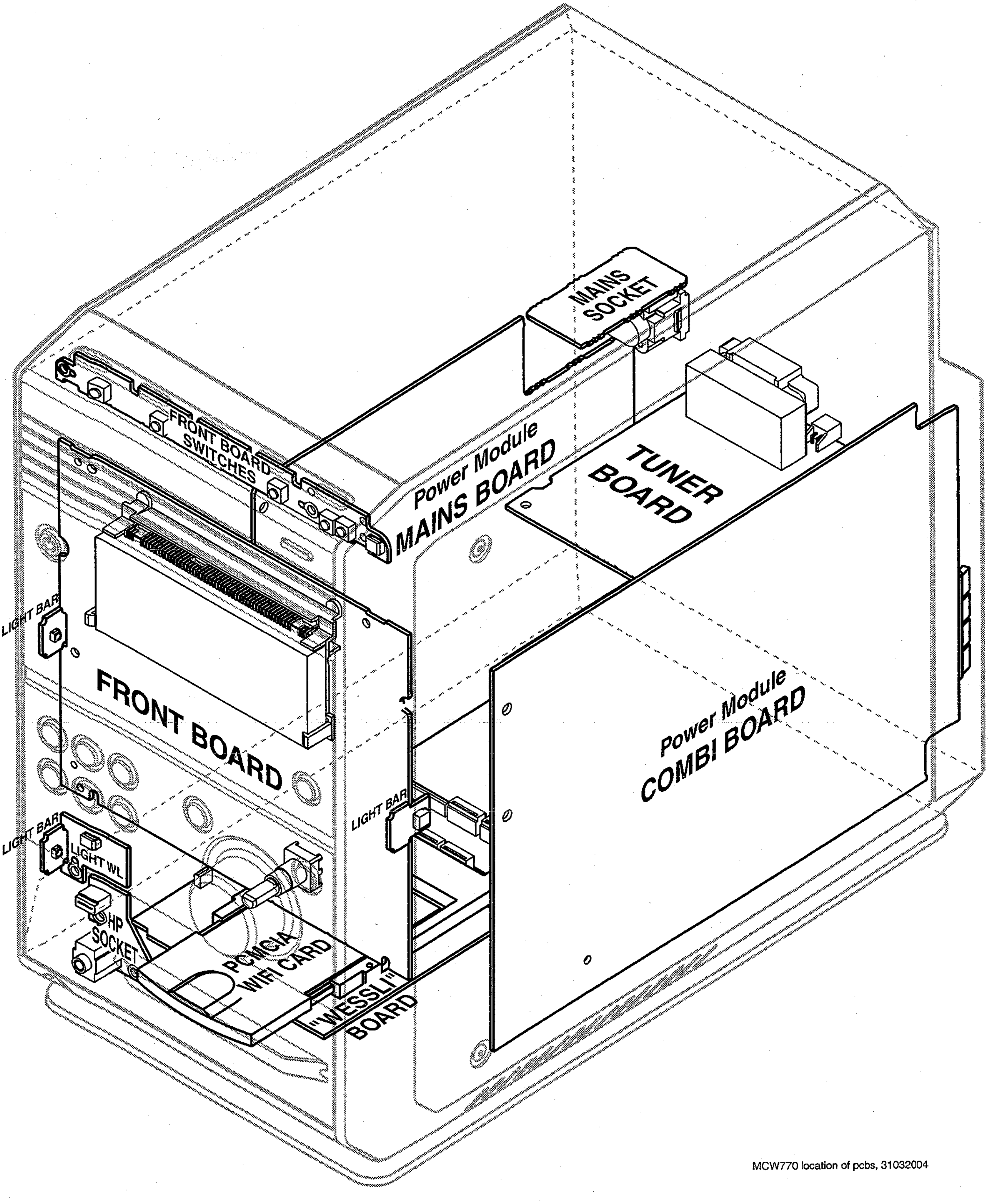
Remote Control:

RC5/RC6 commands ***RC19532014/0***

RC KEY	SYSTEM CODE				COMMAND CODE
	Tuner	**CD**	**Aux.**	**PC LINK**	
⏻ (standby)	17	20	21	057	12
CD	20	20	20	20	63
TUNER	17	17	17	17	63
AUX	21	21	21	21	63
PC LINK	057	057	057	057	063
CD1	20	20	20	20	55
CD2	20	20	20	20	56
CD3	20	20	20	20	57
CD4	20	20	20	20	100
CD5	20	20	20	20	101
VOLUME -	16	16	16	16	17
VOLUME +	16	16	16	16	16
ALBUM +	17	20	21	057	32 (Tuner) 112 (CD) 30 (Aux) 139 (PC Link)
ALBUM -	17	20	21	057	33 (Tuner) 113 (CD) 31 (Aux) 140 (PC Link)
■ (stop)	17	20	21	057	54 (Tuner, CD, Aux) 049 (PC Link)
▶❚❚ (play/pause)	17	20	21	057	53 (Tuner, CD, Aux) 044 (PC Link)
⏮ (track / tune)	17	20	21	057	31 (Tuner) 33 (CD, Aux) 033 (PC Link)
⏭ (track / tune)	17	20	21	057	30 (Tuner) 32 (CD, Aux) 032 (PC Link)
REPEAT	NO CODE	20	NO CODE	057	29 (CD) 029 (PC Link)
PROGRAM	17	20	21	NO CODE	122 (Tuner) 36 (CD, Aux)
SHUFFLE	NO CODE	20	NO CODE	057	28 (CD) 028 (PC Link)
DISPLAY	17	20	NO CODE	057	11 (Tuner, CD) 072 (PC Link)
SLEEP	16	16	16	16	38
CLOCK	16	16	16	16	15
TIMER	16	16	16	16	48
TIMER ON/OFF	16	16	16	16	89
RDS/NEWS	17	17	17	17	15
DIM	16	16	16	16	71
DSC	16	16	16	16	79
VEC	16	16	16	16	107
HOME	057	057	057	057	141
MUTE	16	16	16	16	13

The RC19532014 uses standard RC5 codes for Tuner- CD- and Aux-mode
and standard RC6 code for PC Link-mode.

LOCATION OF PRINTED BOARDS


MAINS SOCKET
FRONT BOARD SWITCHES
Power Module
MAINS BOARD
TUNER BOARD
LIGHT BAR
FRONT BOARD
Power Module
COMBI BOARD
LIGHT BAR
LIGHT BAR
LIGHT WL
HP SOCKET
PCMCIA WIFI CARD
"WESSLI" BOARD

MCW770 location of pcbs, 31032004

WARNINGS & SAFETY

(GB) WARNING

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wristband with resistance. Keep components and tools at this potential.

(F) ATTENTION

Tous les IC et beaucoup d´autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévite pourrait être considérablement écourtée par le fait qu´aucune précaution nést prise à leur manipulation.
Lors de réparations, s´assurer de bien être relié au même potentiel que la masse de l´appareil et enfileer le bracelet serti d´une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l´on utilise soient également à ce potentiel.

ESD

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.
Sorgen Sie dafür, daß Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(NL) WAARSCHUWING

Alle IC´s en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparationi occorre quindi essere collegato allo stesso potenziale che quello della massa delàpparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB) AVAILABLE ESD PROTECTION EQUIPMENT :

KIT ESD3 (small tablemat, wristband, connection box, extension cable and earth cable)	4822 310 10671
wristband tester	4822 344 13999

SAFETY

(GB)
Safety regulations require that the set has to be restored to its original condition and parts which are identical with those specified be used. Replace safety components only by components identical to the original ones.
Safety components are marked by the symbol ⚠

(F)
Les normes de sécurité exigent que l´appareil soit remis à l´état d´origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.
Les composants de sécurité sont marqués ⚠

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Bauteile gleicher Spezifikation zu verwenden. Für Sicherheitsbauteile sind Originalersatzteile zu verwenden.
Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.
De Veiligheidsonderdelen zijn aangeduid met het symbool ⚠

(I)
Le norme di sicurezza estigono che l´apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambiago identici a quelli specificati.
Componenty di sicurezza sono marcati con ⚠

(GB) **DANGER:** Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

CLASS 1
LASER PRODUCT

(S) Varning !
Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(DK) Advarsel !
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

(FIN) Varoitus !
Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen !

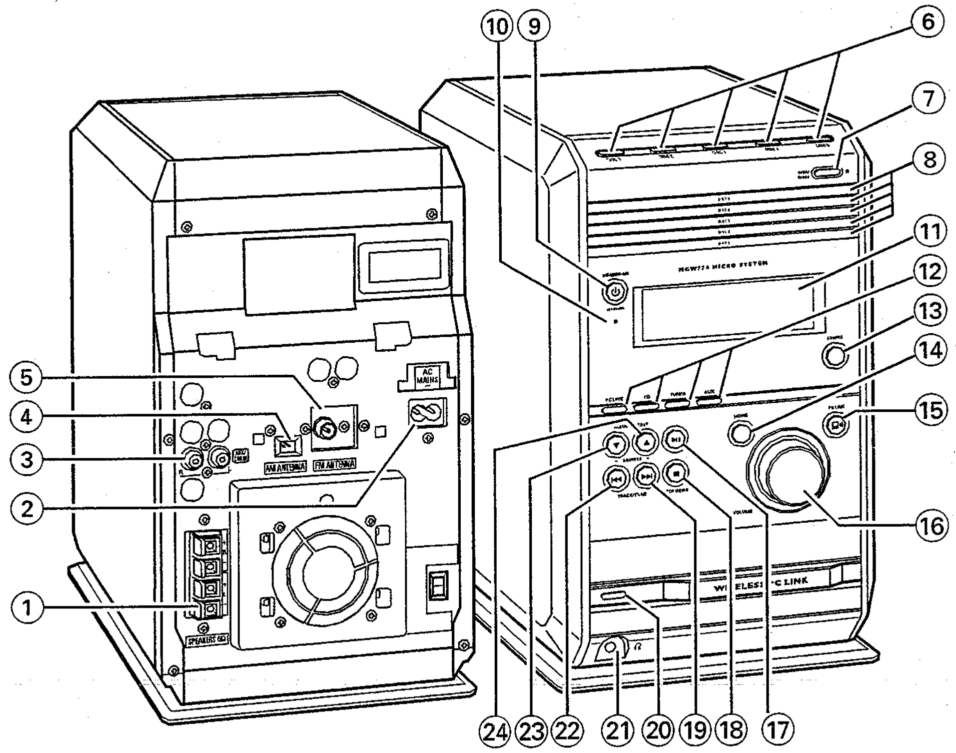
(GB)
After servicing and before returning the set to customer perform a leakage current measurement test from all exposed metal parts to earth ground, to assure no shock hazard exists.
The leakage current must not exceed 0.5mA.

(F)
"Pour votre sécurite, ces documents doivent être utilisés par des spécialistes agreés, seuls habilités à réparer votre appareil en panne".

BRIEF OPERATING INSTRUCTIONS

The following excerpt of the Owner's Manual serves as a very short introduction to the set.
The complete Owners Manual can be downloaded in several languages from the Internet site of Philips Customer Care Center: **www.p4c.philips.com**

Controls and connections



On the back

① **SPEAKERS 6Ω L/R**
connect to the supplied speakers

② **AC MAINS ~**
After all other connections have been made, connect the mains lead to the wall socket.

③ **AUX/CDR IN R/L**
connect to the analogue audio output of an additional appliance

④ **AMANTENNA**
connect the supplied loop antenna here

⑤ **FMANTENNA**
connect the supplied wire antenna here

On the front

⑥ **DISC 1, DISC 2, DISC 3, DISC 4, DISC 5**
selects a disc tray and starts playback

⑦ **OPEN/CLOSE ▲**
opens/closes the disc tray

⑧ disc trays

Controls and connections

⑨ **STANDBY-ON** ⏻
switches the set to (Eco Power) standby

⑩ **iR**
sensor for the infrared remote control
Note:Always point the remote control towards this sensor.

⑪ display

⑫ **source control lights**
when a source is active the respective control light lights up

⑬ **SOURCE**
toggles between the sources:
CD: the CD changer is selected
TUNER FM: the FM tuner waveband is selected
TUNER MW: the MW tuner waveband is selected
AUX: the high level input sensitivity for an additional connected appliance is selected
AUX CDR: the low level input sensitivity for an additional connected appliance is selected

⑭ **HOME**
PC LINK: returns to the first level of the file structure

⑮ **PC LINK**
selects the connected PC as source

⑯ **VOLUME rotary**
adjusts the volume

⑰ **▶II**
starts and interrupts plaback

⑱ **STOP DEMO ■**
- stops playback
- deactivates/activates the demonstration mode (press and hold the button for 5 seconds)

⑲ **▶▶I**
CD:
- selects the next track
- searches forwards (press and hold the button) within the current track

TUNER: tunes to a higher radio frequency (press and hold the button for more than a half second)
CLOCK or TIMER: sets the minutes
PC LINK: selects the next item

⑳ **WIRELESS PC LINK control light**
lights up and blinks when PC LINK data are transferred

㉑ 🎧
3.5 mm headphone socket
Note: Connecting the headphones will switch off the speakers.

㉒ **I◀◀**
CD:
- selects the previous track
- searches backwards (press and hold the button) within the current track

TUNER: tunes to a lower radio frequency (press and hold the button for more than a half second)
CLOCK or TIMER: sets the minutes
PC LINK: selects the previous item

㉓ **ALBUM/PRESET ▼ BROWSE –**
CD: selects the previous album on an MP3-CD
TUNER: selects the previous preset radio station
PC LINK: selects the previous level
CLOCK or TIMER: sets the hours

ALBUM/PRESET ▲ BROWSE +
CD: selects the next album on an MP3-CD
TUNER: selects the next preset radio station
PC LINK: selects the next level
CLOCK or TIMER: sets the hours

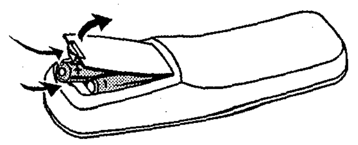
Quick Use Guide

This Quick Use Guide gives a rough overview and helps to start quickly with basic steps. Please read the supplied instruction manual for detailed information.

Supplied accessories

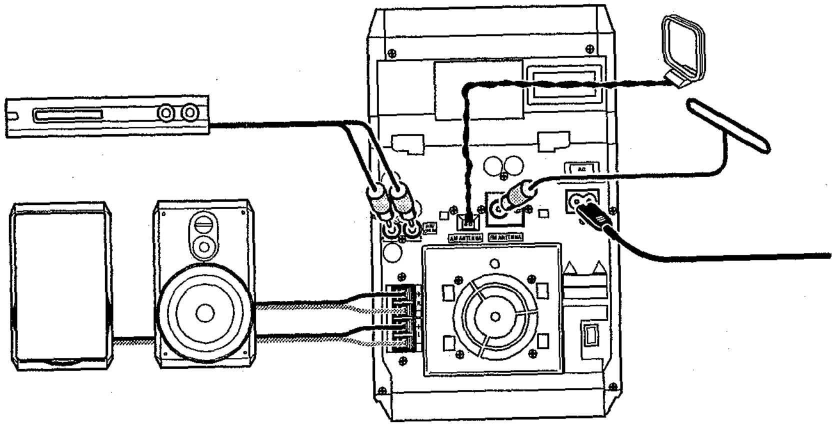
- PC link software installer CD-ROM
- Wireless USB adapter and extension cable
- Remote control and 2 batteries, size AA
- 2 loudspeaker boxes including 2 speaker cables
- AM/MW loop antenna
- FM wire antenna
- AC power cord

1 Insert batteries



Open the battery compartment of the remote control and insert 2 alkaline batteries, type **AA** (R06, UM-3).

2 Connect speakers, antennas, an additional appliance (optional) and the AC power cord



1 Connect the speaker cables to the MCW770.
Use the supplied speakers only. Using other speakers can damage the set or the sound quality will be negatively affected.

2 Connect the AM/MW antenna.

3 Connect the FM antenna.

4 If you want to connect an additional appliance, use a cinch cable to connect the audio inputs of the MCW770 to the audio outputs of the additional appliance.

5 Check whether the mains voltage as shown on the type plate corresponds to your local mains voltage. If it does not, consult your dealer or service organisation.

Make sure all connections have been made before switching on the mains supply.

Connect the AC power cord supplied to AC MAINS ~ and to the wall socket.

3 Install the tuner

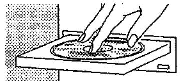
1 When the AC power cord is connected for the first time to the wall socket, TUNER and AUTO INSTALL - PRESS PLAY are displayed.

2 Press ▶II on the set to store all available radio stations automatically.
→ Automatic searching and storing starts. Once completed, the last tuned radio station will be played.

4 Install the wireless connection to your PC

PC system requirements:
- **Windows 98SE/ME/2000/XP**
- **Pentium Class 300MHz processor or higher**
- **CD-ROM drive**
- **USB port**
- **Free hard disk space: 100 MB for the software**

Do not connect the wireless USB adapter immediately! You will be asked during the installation process to connect it.

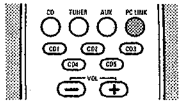

computer

1 Place the set as close as possible to the PC.

2 Switch on your PC and insert the installation disc.

Note: Do not use the 🔘 *icon, which will appear on the PC screen during the installation process.*

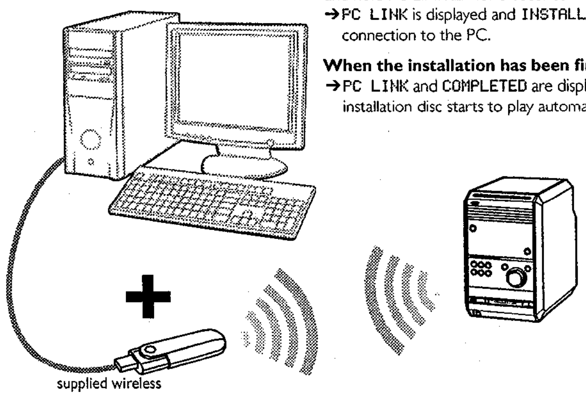
3 The installation guide will appear automatically. If it does not, go to the CD-ROM drive in Windows Explorer and double click on the **SETUP_.exe**. Then continue as follows:
- Select your desired language from the list.
- Select **Installing Software** and then select **Quick Installation** and click **Install**.
- Then follow the installation steps prompted by the screen to install the wireless USB adapter driver, the Philips Media Manager software and the network setup.



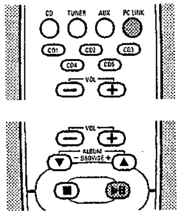
4 Switch on the set and press PC LINK.

5 During the network setup you will be asked to go to the install mode: Press and hold PC LINK for 5 seconds.
→PC LINK is displayed and INSTALLING is scrolled. The set searches for a connection to the PC.

When the installation has been finished successfully:
→PC LINK and COMPLETED are displayed. The demo track from the installation disc starts to play automatically.


supplied wireless USB adapter

5 Play your music collection from the PC via the set



1 At installation time or later add your MP3 music folders and files to the Philips Media Manager. Only those folders and files you can see in the Philips Media Manager will be accessible from the MC W770.

2 Make sure your PC is switched on.

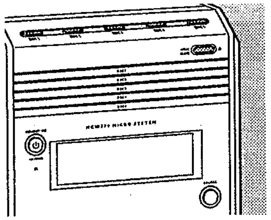
3 Press PC LINK to select the PC as source.

4 As soon as the connection is established:
→ PC LINK is displayed and a track name is scrolled.

5 Press ▶II to start playback.
→ PC LINK is displayed and the track name is scrolled.
→ PC LINK and the elapsed playing time are displayed.

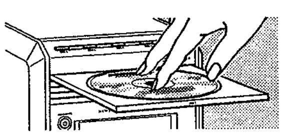
6 Play your discs on the set

For playback on this set you can use:
- **All pre-recorded audio CDs**
- **All finalised audio CDR and CDRW discs**
- **MP3-CDs (CD-ROMs with MP3 tracks)**

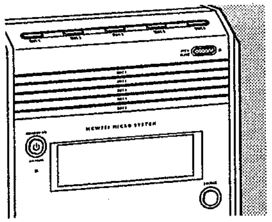


1 Press OPEN/CLOSE ▲ on the set.

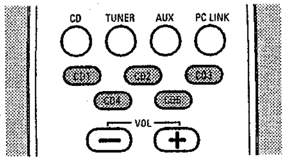
2 Press one of the disc keys (DISC 1, DISC 2, DISC 3, DISC 4, or DISC 5) on the set to select the desired disc tray to be opened.



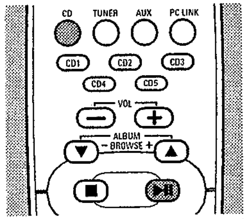
3 Load a disc with the printed side up.



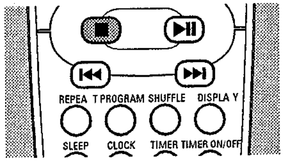
4 Press OPEN/CLOSE ▲ again on the set to close the tray.



5 ***If you want to play one particular disc:***
Press one of the disc keys CD 1, CD 2, CD 3, CD 4, or CD 5 on the remote control to start playback of the desired disc in the selected tray.

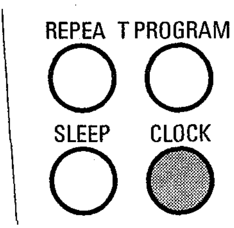


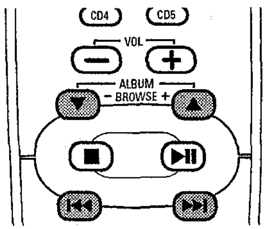
If you want to play all loaded discs:
Press CD on the remote control.
Then press ▶II to start playback.

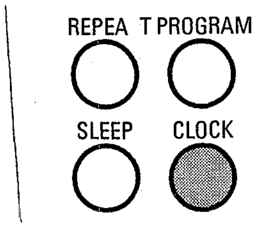


○ To stop playback press STOP ■.

7 Setting the clock







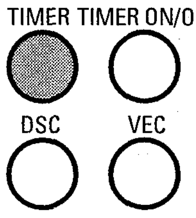
1 Press and hold CLOCK on the remote control for more than 2 seconds.
→ SET CLOCK is displayed, the hours and minutes digits start blinking.

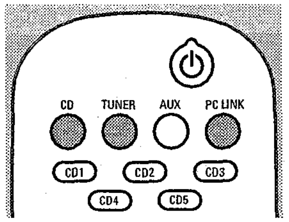
2 Press ALBUM▲or ALBUM ▼ on the remote control repeatedly to set the hour.

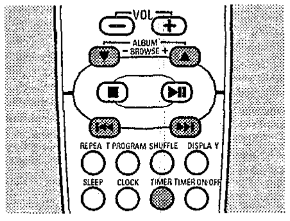
3 Press I◀◀ or ▶▶I on the remote control repeatedly to set the minutes.

4 Press CLOCK on the remote control to confirm the setting.
→ The clock shows the set time.

8 Timer setting







1 Press and hold TIMER on the remote control for more than 2 seconds.
→ ⏲ starts blinking, SET TIMER is displayed and the hours and minutes digits start blinking.

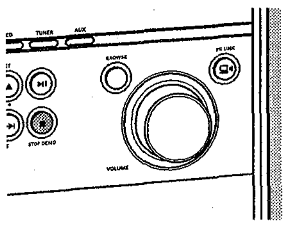
2 Press CD,TUNER or PC LINK on the remote control to select the source you want to be woken up with.

3 Press ALBUM ▲ or ALBUM ▼ on the remote control repeatedly to set the hour.

4 Press I◀◀ or ▶▶I on the remote control repeatedly to set the minutes.

5 Press TIMER on the remote control to confirm the setting.

9 Demonstration mode



To activate the demonstration mode press and hold STOP DEMO ■ for 5 seconds during standby or Eco Power standby on the set until DEMO ON is displayed

To deactivate the demonstration mode press and hold STOP DEMO ■ again on the set for 5 seconds until DEMO OFF is displayed

Frequently asked questions

Important
Do not plug in the wireless USB adapter into a USB port of your computer, but start with the software installation first from the CD-ROM. After the necessary driver software has been installed you will be asked by the installation software to plug in the wireless USB adapter. This order of installation will ensure the proper function of your wireless USB adapter.

Wireless USB adapter

Question	Answer
I have plugged in the wireless USB adapter and completed the installation in Windows without installing the software from the bypacked CD-ROM first. What should I do?	In order that you can install the correct driver software for the wireless USB adapter, please do the following: **1** Open Windows **Start Menu/Settings/ Control Panel/System/Hardware/ Device Manager** **2** Select **Other Devices** and delete the USB WLAN device. **3** Unplug the wireless USB adapter. **4** Start the installation from the CD-ROM with **unplugged** wireless USB adapter! **5** You will be asked during the installation to plug in the adapter again.
I have followed the instructions for use and the instructions shown on the installation software exactly but cannot successfully install.	Possibly you have a problem with the quality of the wireless link. We propose using the extension cable which is delivered with the MCW770 Philips audio system and placing the wireless USB adapter as close as possible to the front side of the MCW770. Start the installation again.
Since I have changed the USB port for the wireless USB adapter I have longer connection times from my MCW770 audio system to the PC.	Your installation was optimised for the first USB port used. In order to decrease connection time for the new USB port, you have to configure the new USB port for your PC link network. Select from the CD-ROM setup the **Network Utilities** and then the **Install different USB port** menu. Follow the instructions of the setup programme. For more information please refer to the IFU chapter "Change of USB port using the MC W770".

Frequently asked questions

I have lost my bypacked wireless USB adapter, what can I do?	You can order the wireless USB adapter at your local Philips Service organisation. The MC W770 PC link mode will also work with most other WiFi certified wireless adapters. But you have to perform a complete new setup, and a big part of the network setup has to be done manually. First install the new wireless adapter according to its manual. Use the MC W770 installation disc and select **Setup Network.** Continue the installation according IFU chapter "Using a different wireless network adapter". Your stored music files will not get lost.

Philips Media Manager Software

Question	Answer
Why can the tracks stored in my PC not be played even though I have successfully installed PC link?	Through PC link you have access only to those music files which are in the library of the Philips Media Manager software. The IFU chapter Preparation for wireless PC Link playback function describes how you can add MP3 music files to the Philips Media Manager.
How can I organise my tracks in the music library and in the MC W770 PC Link view?	Edit the Album, Title and other ID3 Tag information of your MP3 files with the Philips Media Manager software, so you can group your songs accordingly. To edit ID3 information select the track(s) you'd like to edit, right click and select the 'Edit Media Information...' from the popup menu.
If I already have a Musicmatch software installed in my PC, can I skip the installation of Musicmatch which comes with the CD-ROM?	Your Musicmatch software has to support the UPnP™ server function in order to be able to connect your Philips audio system MC W770 to your PC. We recommend installing the Musicmatch version from the CD-ROM.
How can I get a newer version of the Philips Media Manager?	You can download the latest version of the Phlips Media Manager from http://www.my.philips.com

Frequently asked questions

Can I use other music archiving software than Philips Media Manager?	You can use another music archiving system than Philips Media Manager under condition that it provides an Universal Plug and Play (UPnP™) server interface.

Universal Plug and Play

Question	Answer
What is Universal Plug and Play?	Universal Plug and Play (UPnP™) allows easy interoperability of devices supporting this network techology. UPnP™ builds on standard networking technologies and provides standardized protocols for a wide variety of home and small business devices.
What does Universal Plug and Play mean for MC W770?	MC W770 implements the UPnP™ technology to get access, navigate and stream audio from a UPnP™ music server.

Network setup and system configuration

Question	Answer
Can I have more than one PC (server) to connect to this audio system?	Yes, you can add more than one PC (server) to your audio system's configuration. Start the CD-ROM installation on a PC which you want to add to your audio system and choose **Add new PC server** from the **Custom Installation** menu. Follow the instructions of the setup programme. For more information please refer to the IFU chapter "Installation of an additional PC server or recovery of PC link settings on your PC".
Can I have more than one network to connect to this audio system?	Yes, you can connect your audio system to more than one network. Each network configuration has to be added to your audio system using the installation CD. For more information please refer to the IFU chapter "Integration of MC W770 into an existing (home) network". When installed, browse through the installed networks using the ◀◀, ▶▶ keys while the display shows NETWORK in the first line. The network's name is scrolled in the second display line. Select a network by pressing the key on your set.

Frequently asked questions

What maximum number of networks can be installed with Philips audio system MC W770?	You can install 5 different networks.
Can I have more than one Philips audio system MC W770 to connect to my PC?	Yes, you can connect more than one Philips audio system MC W770 to your PC. In the CD-ROM installation select **Custom Installation** and then the **Add additional Audio System** menu. Follow the instructions of the setup programme. For more information please refer to the IFU chapter "Installation of an additional audio system or recovery if audio system PC link settings are lost."
Can I use my built-in wireless LAN card in my PC to set up the communication with the audio system?	Yes, you can use the built in wireless Lan card of your PC, but you have to setup in Windows a network with this network adapter first. Then use the **Custom Installation** menu from the CD-ROM setup and choose **Network Setup** to add the same network configuration to the audio system. Follow the instructions of the setup programme. For more information please refer to the IFU chapter "Using a different wireless network adapter".
I want to use the PC link function in a wireless network which is already installed. What can I do?	The MC W770 is meant to be used with the bypacked wireless adapter. However, it is possible to use the MC W770 together with most other WiFi certified wireless adapters as well as in infrastructure mode networks using Access Point. Use the **Custom Installation** menu from the CD-ROM setup and choose **Network Setup**. In this advanced setup mode you can add to your audio system the network configuration of your home network. Please note that in this network at least one PC needs the Philips Media Manager installed and active. For more information please refer to the IFU chapter "Integration of MC W770 into an existing (home) network

Frequently asked questions

When I press the PC LINK **button, the display shows** `NO CONNECTION`**. What can I do?**	If you receive this message you might need to restart your Philips Media Manager. To restart the Philips Media Manager, click on its icon on the taskbar and select "Shutdown Philips Media Manger'. Restart the application from the Windows Start menu.
Can PC link work when the PC is in standby?	PC link cannot work when the PC is switched off or in standby.

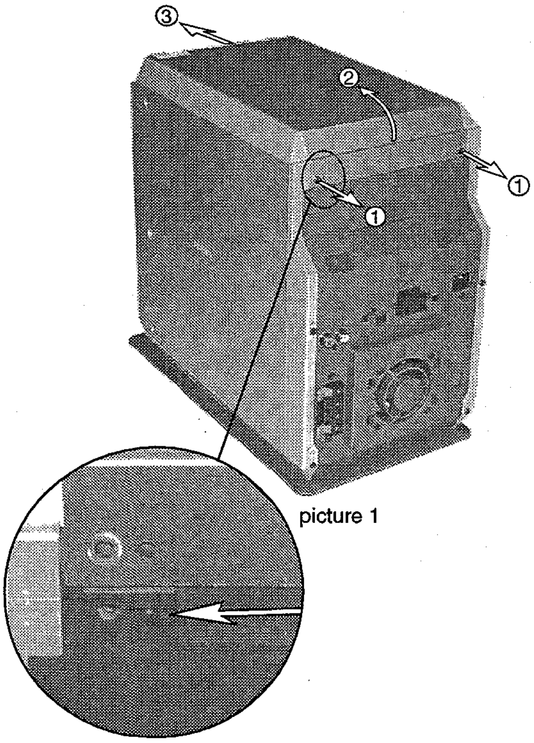
UPnP™ is a certification mark of the UPnP™ Implementers Corporation.

DISMANTLING INSTRUCTIONS

Dismantling the *Top Cover*

- Remove 2 screws as shown in picture 1.
- Raise top cover at the rear and move it frontwards to disengage catches.

Note: the top cover is pre-fixed with burls protruding into a hole. Raising the top cover might need some force. If necessary use a bladed screwdriver.

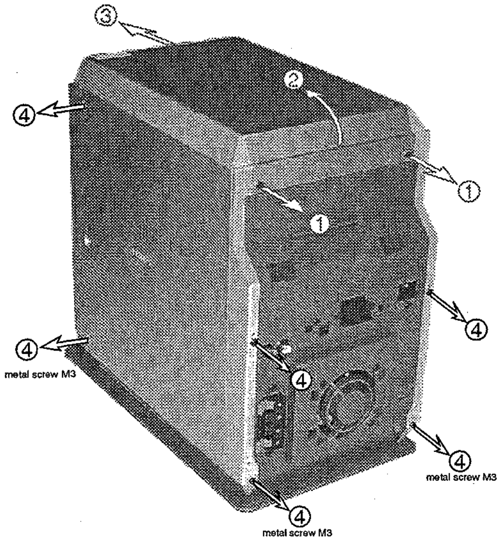


picture 1

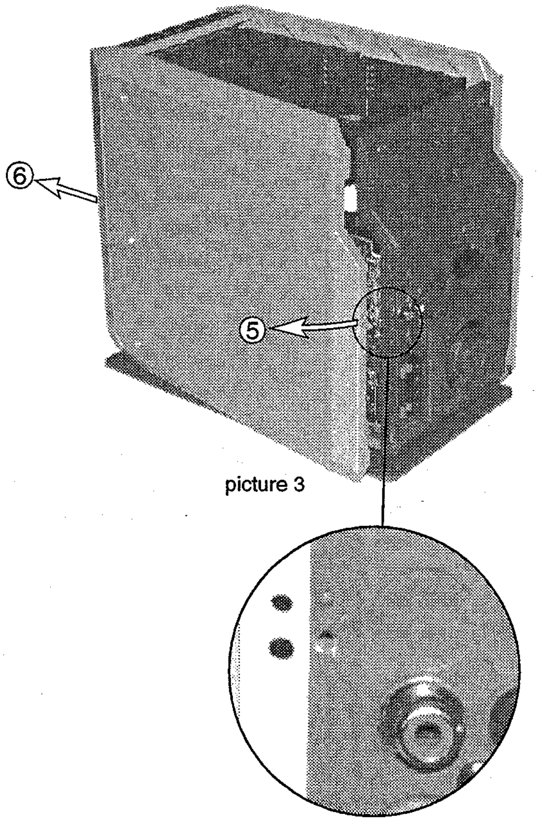
Dismantling the *Cabinet Side panels*

- Dismantle top cover first.
- Remove 4 screws as shown in picture 2.
- Pull off side panel at the rear as shown in picture 3 and move it frontwards to disengage catches.

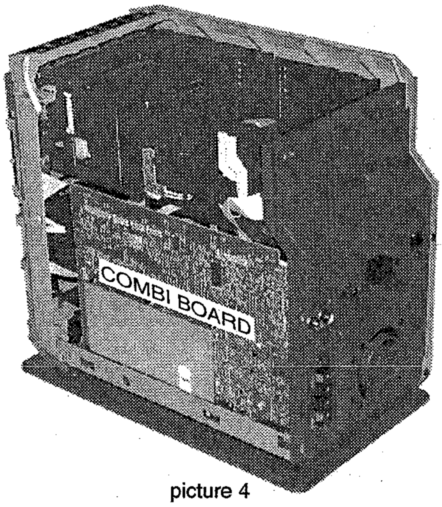
Note: the side panels are pre-fixed with burls protruding into a hole. Pulling off at the rear might need some force. If necessary use a bladed screwdriver.


③
②
④
①
①
④
④
metal screw M3
④
④
metal screw M3
④
metal screw M3

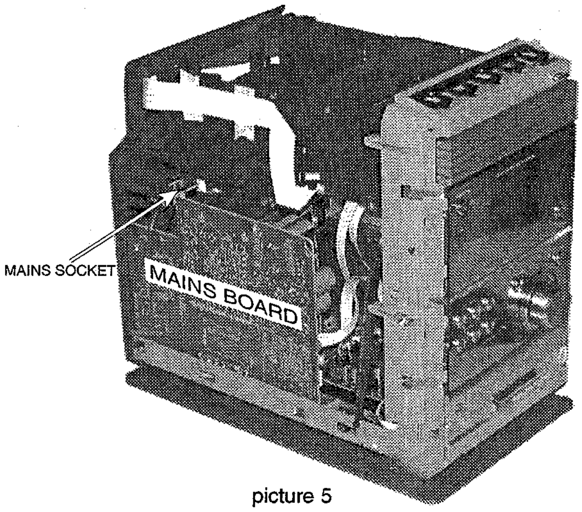
picture 2



picture 3


COMBI BOARD

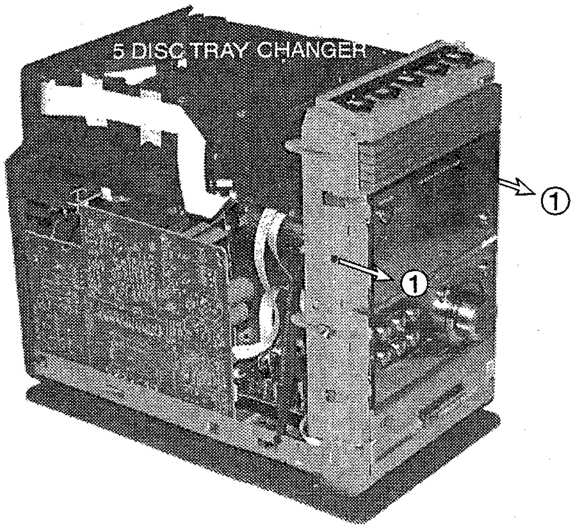
picture 4


MAINS SOCKET
MAINS BOARD

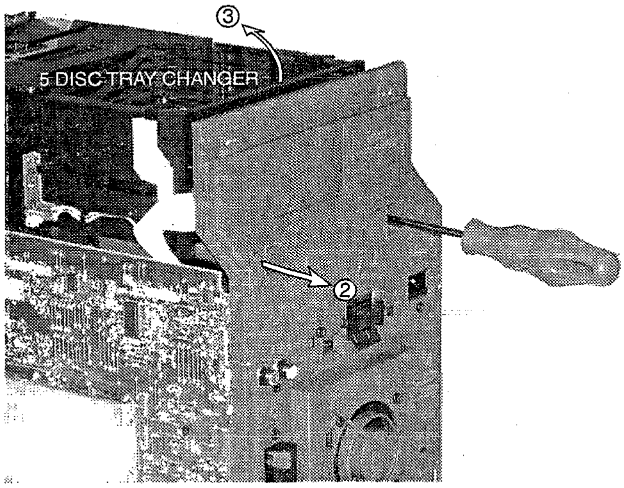
picture 5

Dismantling the *5 Disc Tray Changer*

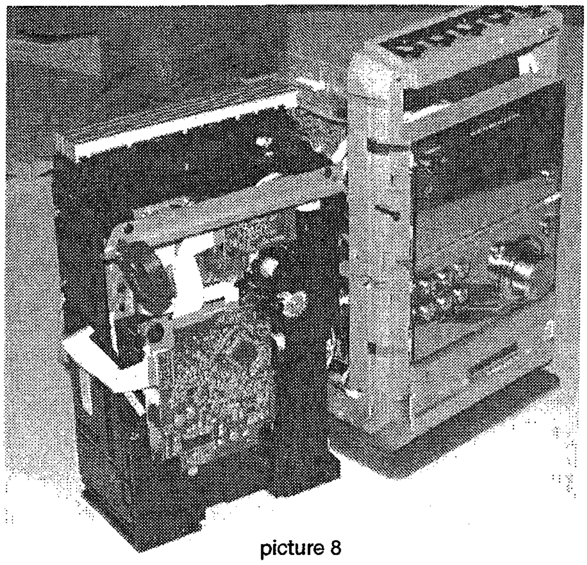
- Dismantle top cover and cabinet side panels first.
- Remove 4 screws as shown in pictures 6 and 7.
- Raise the changer unit at the rear and pull it out of the set.


5 DISC TRAY CHANGER
①
①

picture 6


③
5 DISC TRAY CHANGER
②

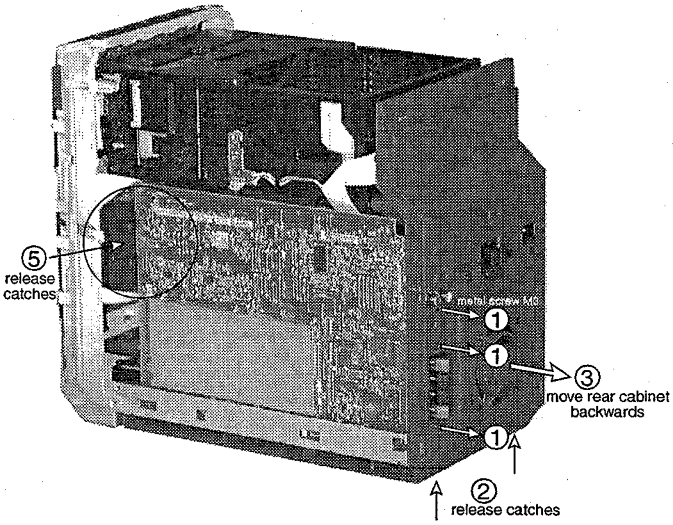
picture 7



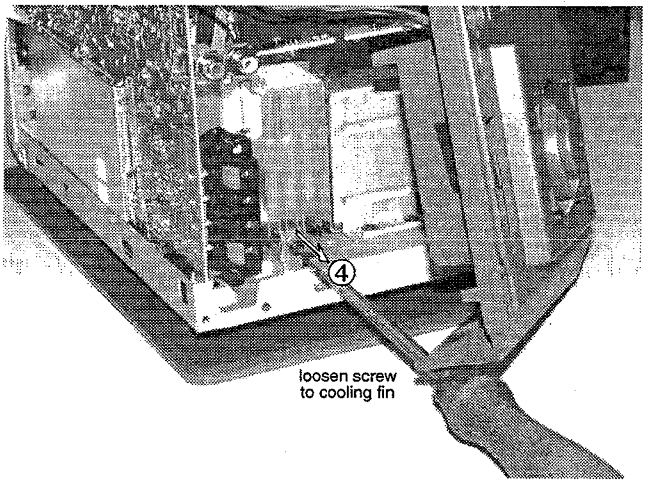
picture 8

Dismantling the *Combi Board*

- Dismantle top cover and cabinet side panels first.
- Remove 3 screws as shown in pictures 9.
- Remove 2 screws fixing the 5DTC.
  It is advised to dismantle the 5DTC completely.
- Release 2 catches of the rear cabinet and move it backwards to get access to the cooling fin.
- Remove 1 screw fixing the cooling fin to the bottom plate → see picture 10.
- Release catches on front side as shown in picture 9 and fetch Combi Board out of the set.


⑤
release catches
metal screw M3
①
①
③
move rear cabinet backwards
①
②
release catches

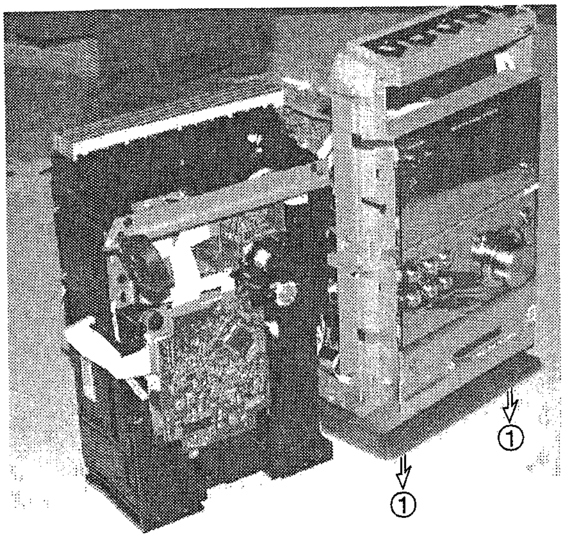
picture 9


④
loosen screw to cooling fin

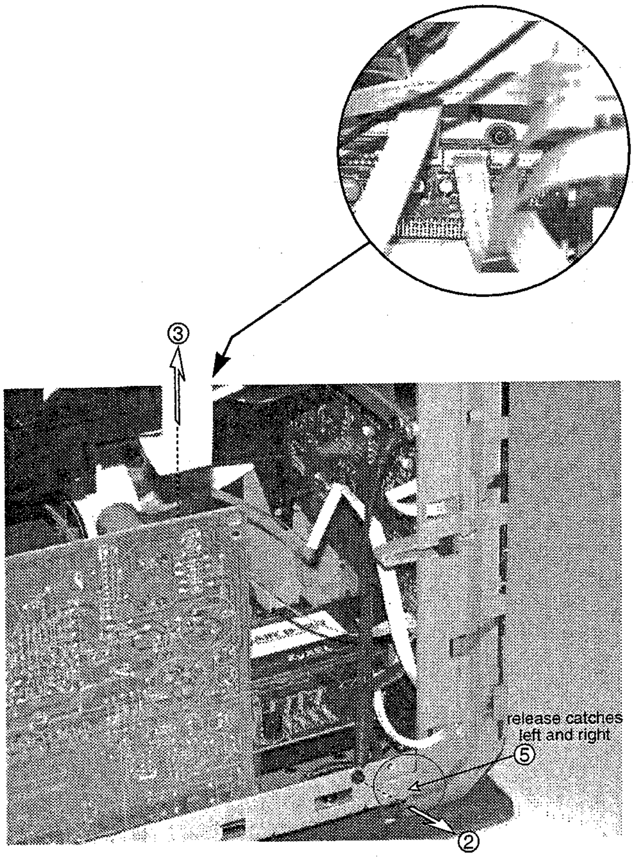
picture 10

Dismantling the *Front Board*

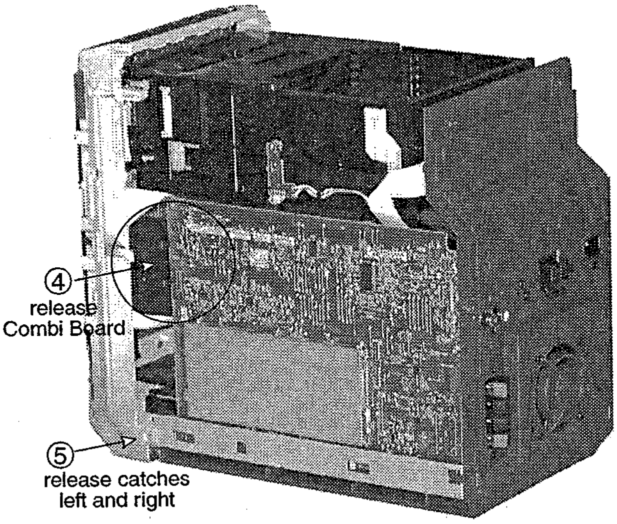
- Dismantle top cover, cabinet side panels and 5DTC first.
- Remove 2 screws at bottom side as shown in pictures 11.
- Remove 1 screw fixing the ground connection.
- Remove 1 screw fixing the Wessli Board to bottom plate.
- Release catches on front side of Combi Board as shown in picture 13.
- Release catches of front cabinet on left and right side and move front assy frontwards until it becomes free.
- Turn the whole unit to a proper service position as shown in picture 14.



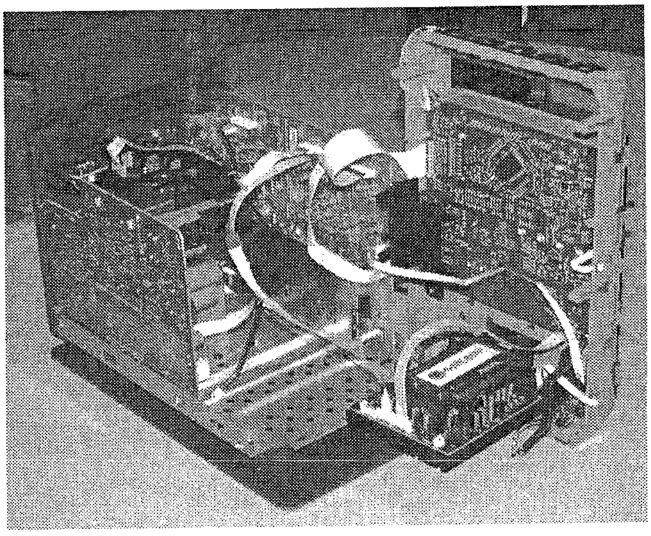
picture 11


③
release catches left and right
⑤
②

picture 12


④
release Combi Board
⑤
release catches left and right

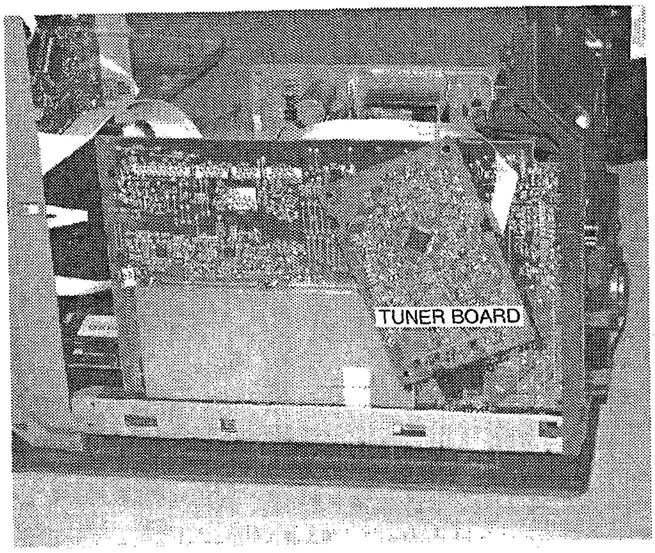
picture 13



picture 14

Dismantling the *Tuner Board*

- Dismantle top cover and right cabinet side panel first.
- Remove 2 (3 for US version)screws from the antenna sockets.
- Release 2 catches and fetch the tuner module out of the set.
- Position the unit to a proper service position as shown in picture 15.



picture 15

SERVICE HINTS

SERVICE TOOLS

TORX T10 screwdriver with shaftlength 150mm	4822 395 50423
TORX screwdriver set SBC 163	4822 295 50145
Audio signal disc SBC 429	4822 397 30184
Playability test disc SBC444	4822 397 30245
Test disc 5 (disc without errors) + **Test disc 5A** (disc with dropout errors, black spots and fingerprints) SBC 426/426A	4822 397 30096
Burn in test disc (65 min. 1kHz signal at -30dB level without "pause")	4822 397 30155

DEMO MODE

The DEMO MODE displays various features of the set.

The Demo mode can be switched on/off as follows:

Press the [STOP DEMO] key on the set at least for 5s.
→ Display shows
DEMO ON else DEMO OFF

DEALER MODE

The sets are equipped with a special DEALER MODE. This mode allows an automatic feature presentation when a dedicated 'demo CD' is detected in tray1.
When the DEALER MODE is switched on and this dedicated 'demo CD' is detected in tray1 Open/Close for tray 1 is blocked to prevent customers from fetching out CDs from exhibition sets. All keys except PC-LINK key and STAND BY-ON key are locked when the disc is playing.

The Trade mode can be switched on/off as follows:
Press the [HOME] key on the set at least for 5s.
→ Display shows
DEMO ON else DEMO OFF

LEAD FREE PRODUCED SET

This set is manufactured with lead-free production technology. This is also indicated by the PHILIPS-lead-free logo you find on the printed boards.

The set is produced with lead-free solder-alloy as well as with lead-free sub-parts. It can be considered as lead-free. Due to this fact some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering-tin Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment.

- Use only adequate solder tools applicable for lead-free soldering-tin.

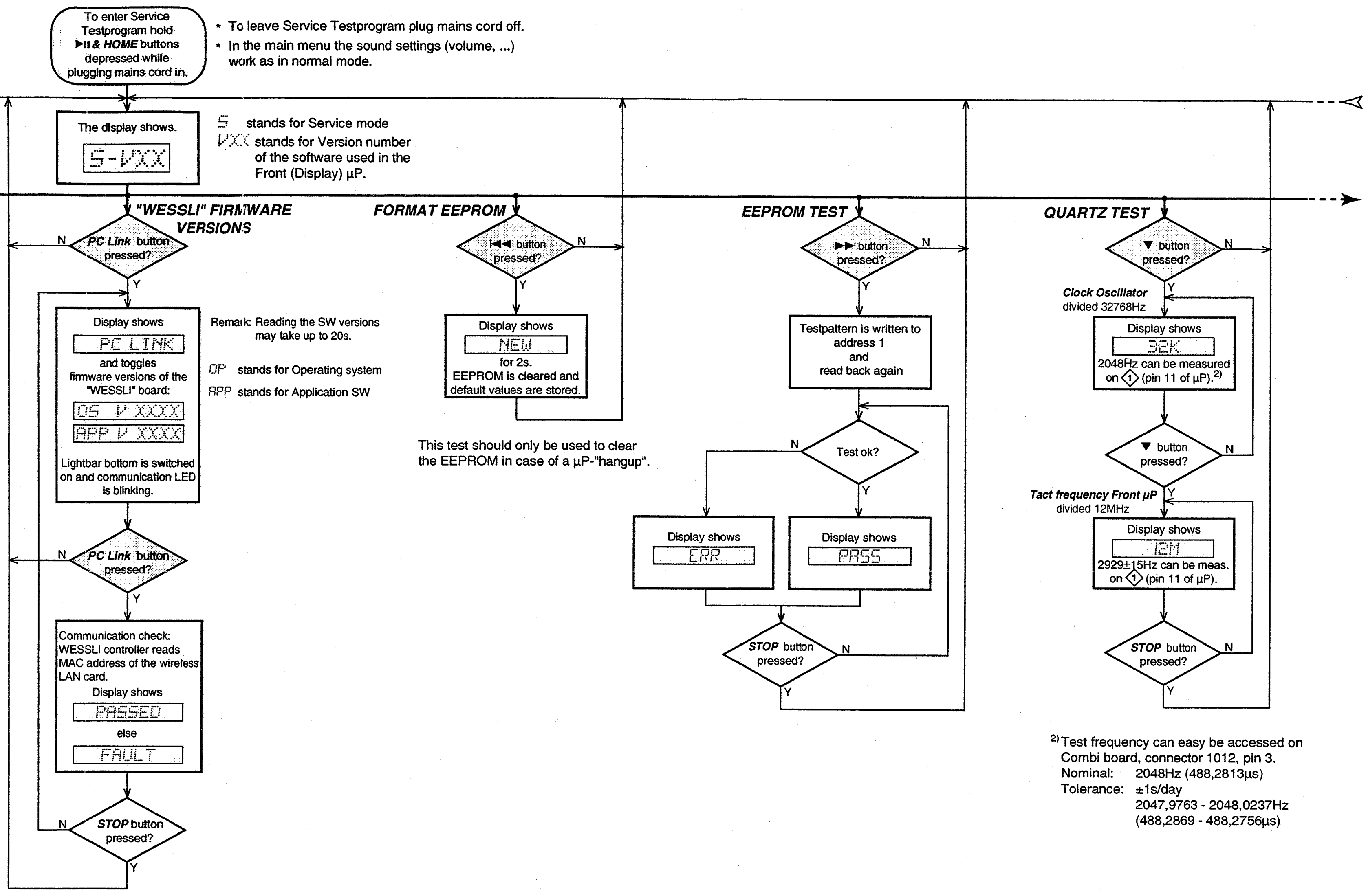
- Adjust your solder tool so that a temperature around 217° – 220° is reached at the solder joint.

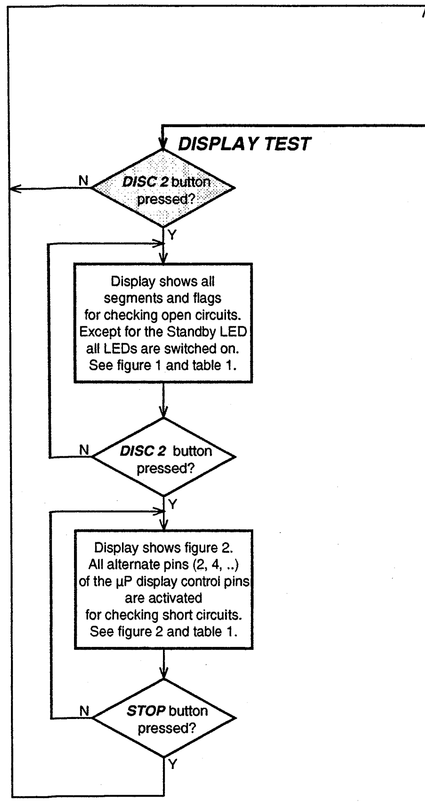
- Do not mix lead-free soldering-tin with leaded soldering-tin. This would lead to unreliable solder joints.

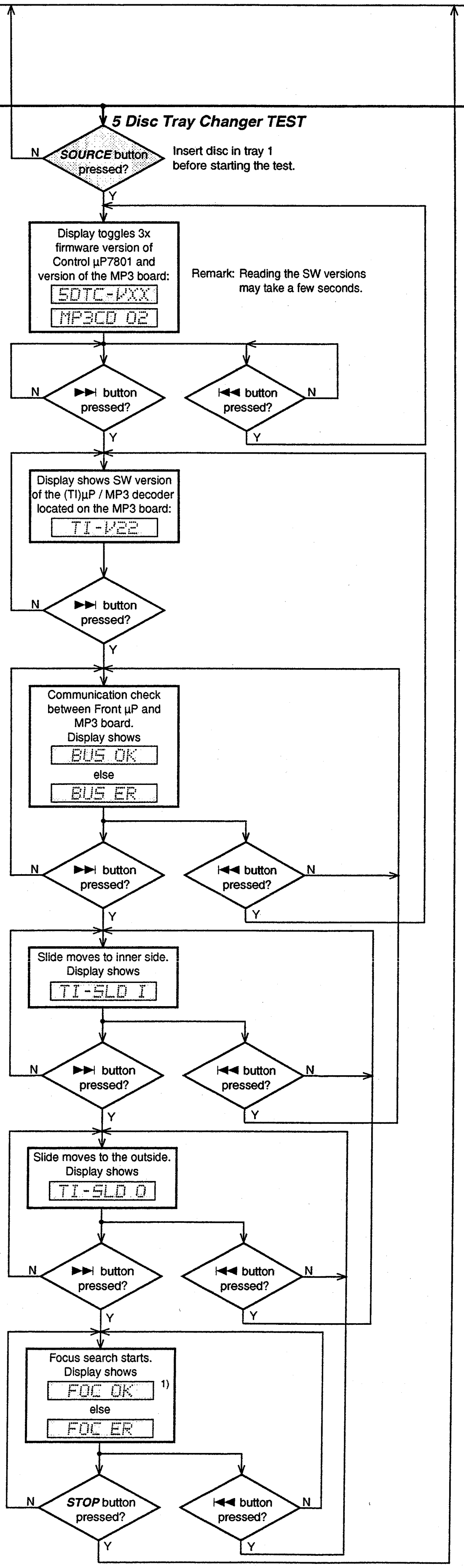
- On our website http://www.atyourservice.ce.philips.com you find more information to
  - aspects of lead-free technology
  - BGA-de-/soldering, heating-profiles of BGAs used in Philips-sets, and others.

PERSONAL NOTES:

SERVICE TESTPROGRAM
PART 1


To enter Service Testprogram hold ▶II & HOME buttons depressed while plugging mains cord in.
* To leave Service Testprogram plug mains cord off.
* In the main menu the sound settings (volume, ...) work as in normal mode.
The display shows.
S-VXX
S stands for Service mode
VXX stands for Version number of the software used in the Front (Display) µP.
"WESSLI" FIRMWARE VERSIONS
PC Link button pressed?
N
Y
Display shows
PC LINK
and toggles firmware versions of the "WESSLI" board:
OS V XXXX
APP V XXXX
Lightbar bottom is switched on and communication LED is blinking.
Remark: Reading the SW versions may take up to 20s.
OP stands for Operating system
APP stands for Application SW
PC Link button pressed?
Communication check: WESSLI controller reads MAC address of the wireless LAN card.
Display shows
PASSED
else
FAULT
STOP button pressed?
FORMAT EEPROM
I◀◀ button pressed?
Display shows
NEW
for 2s.
EEPROM is cleared and default values are stored.
This test should only be used to clear the EEPROM in case of a µP-"hangup".
EEPROM TEST
▶▶I button pressed?
Testpattern is written to address 1 and read back again
Test ok?
Display shows
ERR
Display shows
PASS
STOP button pressed?
QUARTZ TEST
▼ button pressed?
Clock Oscillator divided 32768Hz
Display shows
32K
2048Hz can be measured on ◇1 (pin 11 of µP).2)
▼ button pressed?
Tact frequency Front µP divided 12MHz
Display shows
12M
2929±15Hz can be meas. on ◇1 (pin 11 of µP).
STOP button pressed?


DISPLAY TEST
DISC 2 button pressed?
N
Y
Display shows all segments and flags for checking open circuits. Except for the Standby LED all LEDs are switched on. See figure 1 and table 1.
DISC 2 button pressed?
Display shows figure 2. All alternate pins (2, 4, ..) of the µP display control pins are activated for checking short circuits. See figure 2 and table 1.
STOP button pressed?


5 Disc Tray Changer TEST
SOURCE button pressed?
Insert disc in tray 1 before starting the test.
N
Y
Display toggles 3x firmware version of Control µP7801 and version of the MP3 board:
5DTC-VXX
MP3CD 02
Remark: Reading the SW versions may take a few seconds.
▶▶I button pressed?
I◀◀ button pressed?
Display shows SW version of the (TI)µP / MP3 decoder located on the MP3 board:
TI-V22
▶▶I button pressed?
Communication check between Front µP and MP3 board. Display shows
BUS OK
else
BUS ER
▶▶I button pressed?
I◀◀ button pressed?
Slide moves to inner side. Display shows
TI-SLD I
▶▶I button pressed?
I◀◀ button pressed?
Slide moves to the outside. Display shows
TI-SLD O
▶▶I button pressed?
I◀◀ button pressed?
Focus search starts. Display shows
FOC OK 1)
else
FOC ER
STOP button pressed?
I◀◀ button pressed?

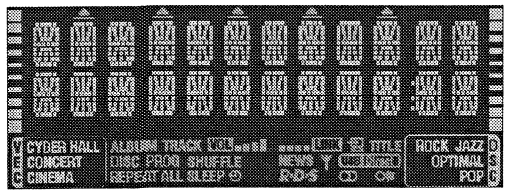

CYBER HALL
CONCERT
CINEMA
ALBUM TRACK
DISC PROG SHUFFLE
REPEAT ALL SLEEP
NEWS
TITLE
ROCK JAZZ
OPTIMAL
POP

fig. 1

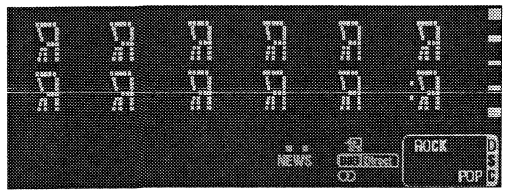

NEWS
ROCK
POP

fig. 2

	pattern1	pattern 2
CD source LED	on	on
TUNER source LED	on	off
AUX source LED	on	on
PC Link source LED	on	off
Light bar top	full brightness	half brightness

table 1

Note: the lightbar bottom and the PC link-communication LED are controlled by the WESSLI board and thus not activated in this test.

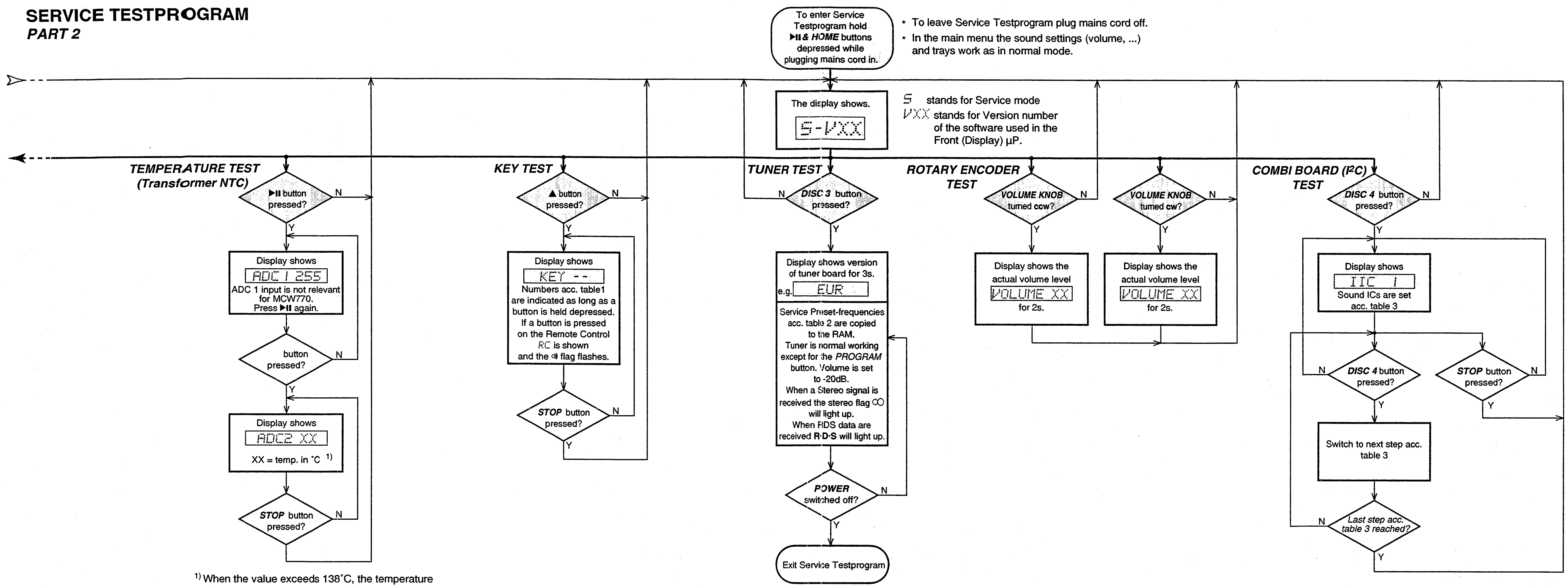
---

[1] As the slide has been moved to the utmost possible outside position before the OPU may stand outside the regular data area of the disc. Thus no Focus might be found. To get a reliable result on the Focus test it is recommended to skip the Slide movement by pressing ▶▶I button twice in quick succession.

[2] Test frequency can easy be accessed on Combi board, connector 1012, pin 3.
Nominal: 2048Hz (488,2813µs)
Tolerance: ±1s/day
2047,9763 - 2048,0237Hz
(488,2869 - 488,2756µs)

SERVICE TESTPROGRAM

PART 2


To enter Service Testprogram hold ▶II & *HOME* buttons depressed while plugging mains cord in.
The display shows.
S-VXX
S stands for Service mode
VXX stands for Version number of the software used in the Front (Display) µP.
TEMPERATURE TEST (Transformer NTC)
▶II button pressed?
N
Y
Display shows
ADC 1 255
ADC 1 input is not relevant for MCW770. Press ▶II again.
button pressed?
Display shows
ADC2 XX
XX = temp. in °C 1)
STOP button pressed?
KEY TEST
▲ button pressed?
Display shows
KEY --
Numbers acc. table1 are indicated as long as a button is held depressed. If a button is pressed on the Remote Control RC is shown and the flag flashes.
STOP button pressed?
TUNER TEST
DISC 3 button pressed?
Display shows version of tuner board for 3s.
e.g. EUR
Service Preset-frequencies acc. table 2 are copied to the RAM. Tuner is normal working except for the *PROGRAM* button. Volume is set to -20dB. When a Stereo signal is received the stereo flag ○○ will light up. When RDS data are received R·D·S will light up.
POWER switched off?
Exit Service Testprogram
ROTARY ENCODER TEST
VOLUME KNOB turned ccw?
VOLUME KNOB turned cw?
Display shows the actual volume level
VOLUME XX
for 2s.
COMBI BOARD (I²C) TEST
DISC 4 button pressed?
Display shows
IIC 1
Sound ICs are set acc. table 3
DISC 4 button pressed?
STOP button pressed?
Switch to next step acc. table 3
Last step acc. table 3 reached?

- To leave Service Testprogram plug mains cord off.
- In the main menu the sound settings (volume, ...) and trays work as in normal mode.

1) When the value exceeds 138°C, the temperature of the set is detected as too high and in turn the set will be switched to Standby mode.
This can also be caused by the *Overvoltage Protection circuit*, switching the NTC line to ground.

KEY CODES

KEY	KEY CODE	KEY	KEY CODE
CD1	1	ALBUM - ▼	9
CD2	2	ALBUM + ▲	10
CD3	3	PLAY ▶II	11
CD4	4	HOME	12
OPEN/CLOSE	5	WL PC LINK	13
CD5	6	I◀◀	14
STANDBY-ON	7	▶▶I	15
SOURCE	8	■ (exit)	16

table 1

SERVICE PRESET FREQUENCIES

	EUR	EAS	OSE
REGION / ***PRESET***	***EUROPE FM/MW*** /22	***USA FM/AM*** /37	***OVERSEAS FM/MW*** 2)Grid switchable 10-100kHz/9-50kHz /21
1	87,5 MHz	65,81 MHz	87,5 MHz
2	108 MHz	108 MHz	108 MHz
3	531 kHz	530 kHz	530/531 kHz
4	1602 kHz	1700 kHz	1700/1602 kHz
5	558 kHz	560 kHz	560/558 kHz
6	1494 kHz	1500 kHz	1500/1494 kHz
7		98 MHz	98/87,5MHz
8			
9			
10			
11	98MHz	87,5 MHz	87,5/98MHz

table 2

2) To toggle frequency grid hold ***ALBUM+ ▲ & HOME*** buttons depressed while plugging mains cord in.

Display will show either GRID 9 or GRID 10 for 2 s.

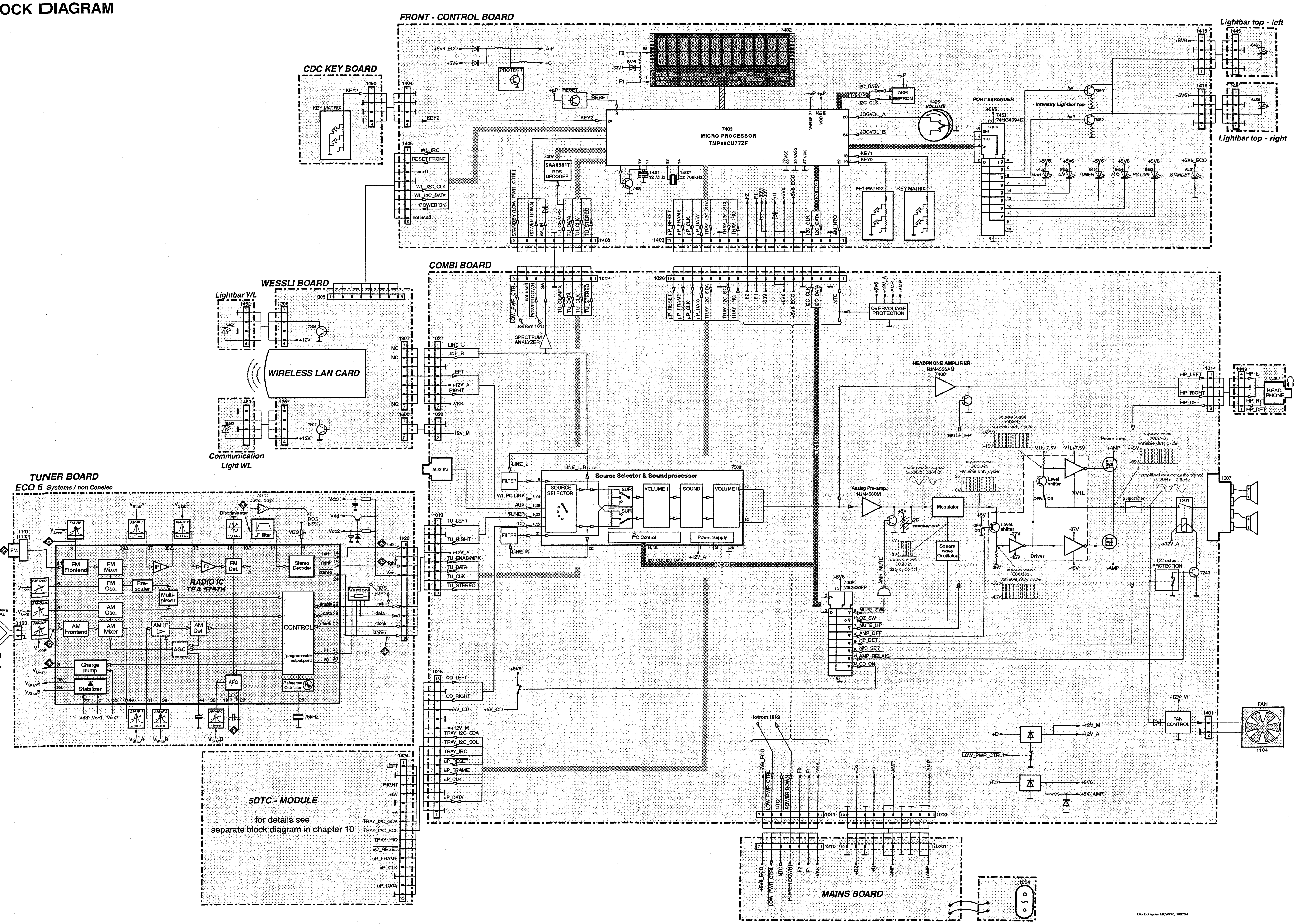
TEST STEPS COMBI BOARD I²C TEST

STEP	SOURCE	BASS	TREBLE	VOLUME	IS	MUTE
IIC 1	AUX	0dB	0dB	-20dB		
IIC 2	AUX	0dB	0dB	-20dB	on	
IIC 3	AUX	0dB	0dB	-20dB		on
IIC 4	AUX	0dB	0dB	-20dB		on
IIC 5	TUNER3)	0dB	0dB	-20dB		
IIC 6	PC LINK3)	0dB	0dB	-20dB		
IIC 7	CD3)	0dB	0dB	-20dB		
IIC 8	AUX	+2dB	+3dB	-20dB		
IIC 9	AUX	0dB	+3dB	0dB		
IIC 10	AUX	+6dB	-6dB	-18dB		
IIC 11	AUX	+4dB	+1,5dB	-18dB		
IIC 12	AUX	0dB	0dB	-20dB		
IIC 13	step 13 to 17 are intended for factory tests only					
IIC 14						
IIC 15						
IIC 16						
IIC 17						
exit	AUX	0dB	0dB	-20dB		

BASS set to ≤0dB --> BASS ALC=off table 3

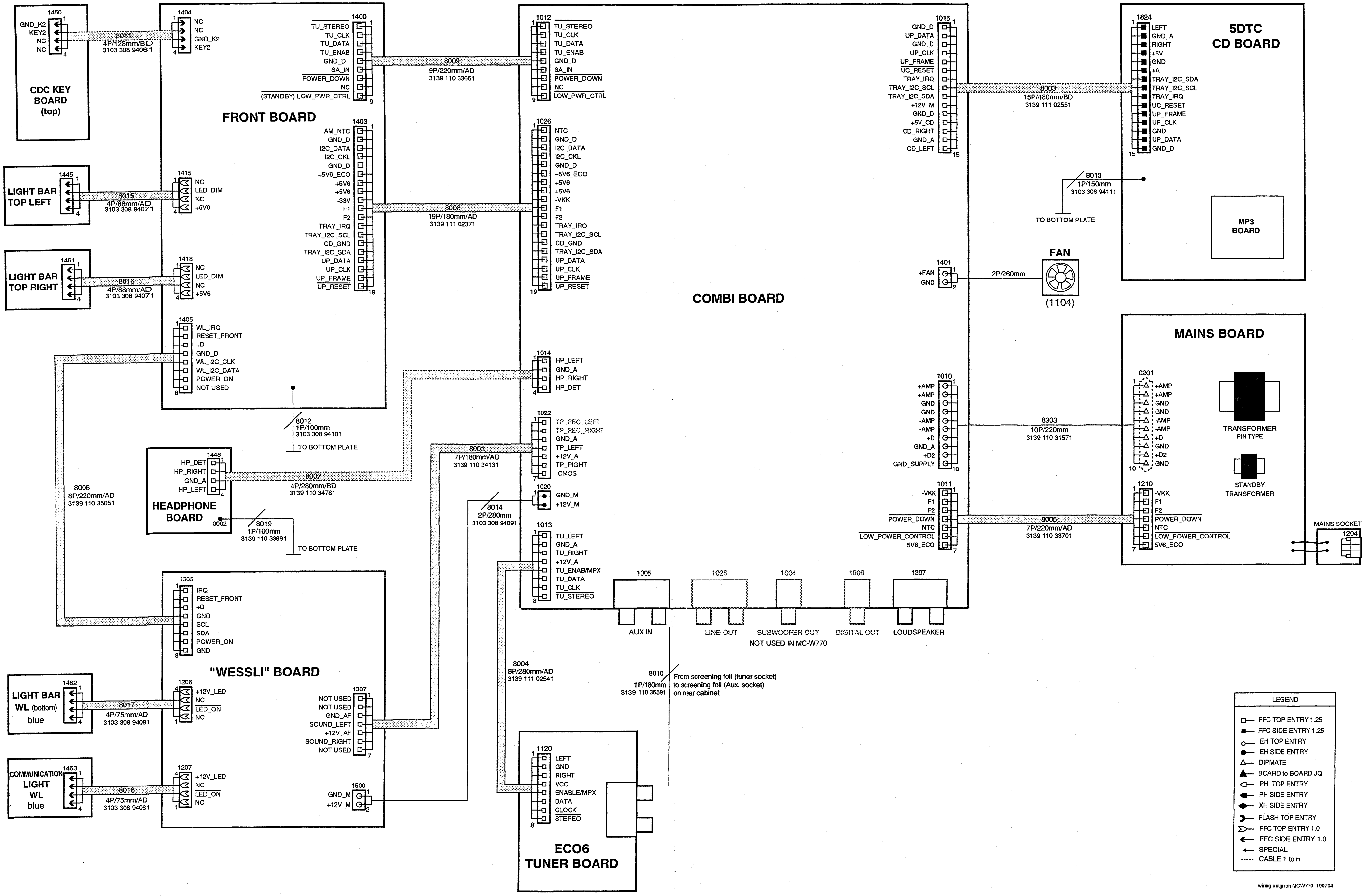
3) Tuner, WESSLI board respectively the CDC module are not switched on in these steps. To check the inputs a signal has to be fed directly to Combi board, sockets 1013, 1022 respectively 1015

BLOCK DIAGRAM


FRONT - CONTROL BOARD
CDC KEY BOARD
KEY MATRIX
KEY2
1450
1404
1405
WL_IRQ
RESET FRONT
+D
WL_I2C_CLK
WL_I2C_DATA
POWER ON
not used
+5V6_ECO
+5V6
+uP
+C
PROTECT
RESET
7402
F2
F1
5V6
-33V
7403
MICRO PROCESSOR
TMP88CU77ZF
7407
SAA6581T
RDS DECODER
1401 12 MHz
1402 32.768kHz
7406
EEPROM
2C_DATA
I2C_CLK
I2C BUS
JOGVOL_A
JOGVOL_B
1425
VOLUME
KEY1
KEY0
KEY MATRIX
KEY MATRIX
PORT EXPANDER
7451
74HC4094D
Intensity Lightbar top
full
half
7450
7452
1415
1445
1418
1461
Lightbar top - left
Lightbar top - right
USB
CD
TUNER
AUX
PC LINK
STANDBY
+5V6_ECO
1400
1403
STANDBY (LOW_PWR_CTRL)
POWER DOWN
SA_IN
TU_CE/MPX
TU_DATA
TU_CLK
TU_STEREO
uP_RESET
uP_FRAME
uP_CLK
uP_DATA
TRAY_I2C_SDA
TRAY_I2C_SCL
TRAY_IRQ
I2C_CLK
I2C_DATA
NTC
COMBI BOARD
1012
1026
LOW_PWR_CTRL
not used
SA
to/from 1011
SPECTRUM ANALYZER
OVERVOLTAGE PROTECTION
+5V6
+12V_A
+AMP
WESSLI BOARD
1305
Lightbar WL
1462
1206
7206
+12V
WIRELESS LAN CARD
1307
NC
1463
1207
7207
1500
Communication Light WL
1022
LINE_L
LINE_R
LEFT
+12V_A
RIGHT
-VKK
1020
+12V_M
AUX IN
FILTER
LINE_L
LINE_R
WL PC LINK
AUX
TUNER
CD
7508
Source Selector & Soundprocessor
SOURCE SELECTOR
SUR
VOLUME I
SOUND
VOLUME II
I²C Control
Power Supply
I2C_CLK I2C_DATA
I2C BUS
1013
TU_LEFT
TU_RIGHT
TU_ENAB/MPX
TU_DATA
TU_CLK
TU_STEREO
1015
CD_LEFT
CD_RIGHT
+5V_CD
+12V_M
TRAY_I2C_SDA
TRAY_I2C_SCL
TRAY_IRQ
uP_RESET
uP_FRAME
uP_CLK
uP_DATA
HEADPHONE AMPLIFIER
NJM4556AM
7400
MUTE_HP
1014
HP_LEFT
HP_RIGHT
HP_DET
1449
1448
HEAD-PHONE
Analog Pre-amp.
NJM4560M
DC speaker out
AMP_MUTE
Modulator
Square wave Oscillator
Level shifter
Driver
Power-amp.
square wave 500kHz variable duty cycle
analog audio signal fs 20Hz...20kHz
amplified analog audio signal fs 20Hz...20kHz
duty cycle 1:1
output filter
1201
1307
DC output PROTECTION
7243
+12V_A
7406
M62320FP
MUTE_SW
OZ_SW
MUTE_HP
AMP_OFF
HP_DET
DC_DET
AMP_RELAIS
CD_ON
+12V_M
FAN CONTROL
1401
FAN
1104
+D
+12V_M
+12V_A
LOW_PWR_CTRL
+D2
+5V6
+5V_AMP
to/from 1012
+5V6_ECO
LOW_PWR_CTRL
NTC
POWER DOWN
F2
F1
-VKK
+D2
+D
-AMP
+AMP
1011
1010
1210
10201
MAINS BOARD
1204
TUNER BOARD
ECO 6 Systems / non Cenelec
1101 (1102)
FM
AM-FRAME AERIAL
1103
FM-RF
FM-Osc
AM-Osc
AM-RF
FM-IF 1
FM-IF 2
MPX buffer ampl.
Discriminator
LF filter
RDS (MPX)
VCO
FM Frontend
FM Mixer
IF1
IF2
FM Det.
Stereo Decoder
FM Osc.
Pre-scaler
Multi-plexer
RADIO IC
TEA 5757H
AM Osc.
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
CONTROL
programmable output ports
Charge pump
Stabilizer
AFC
Reference Oscillator
75kHz
Version
AM-IF 1
AM-IF 2
AM-AFC
Vdd
Vcc1
Vcc2
1120
left
right
stereo
enable
data
clock
5DTC - MODULE
for details see separate block diagram in chapter 10
1824
LEFT
RIGHT
+5V
+A
TRAY_I2C_SDA
TRAY_I2C_SCL
TRAY_IRQ
uC_RESET
uP_FRAME
uP_CLK
uP_DATA

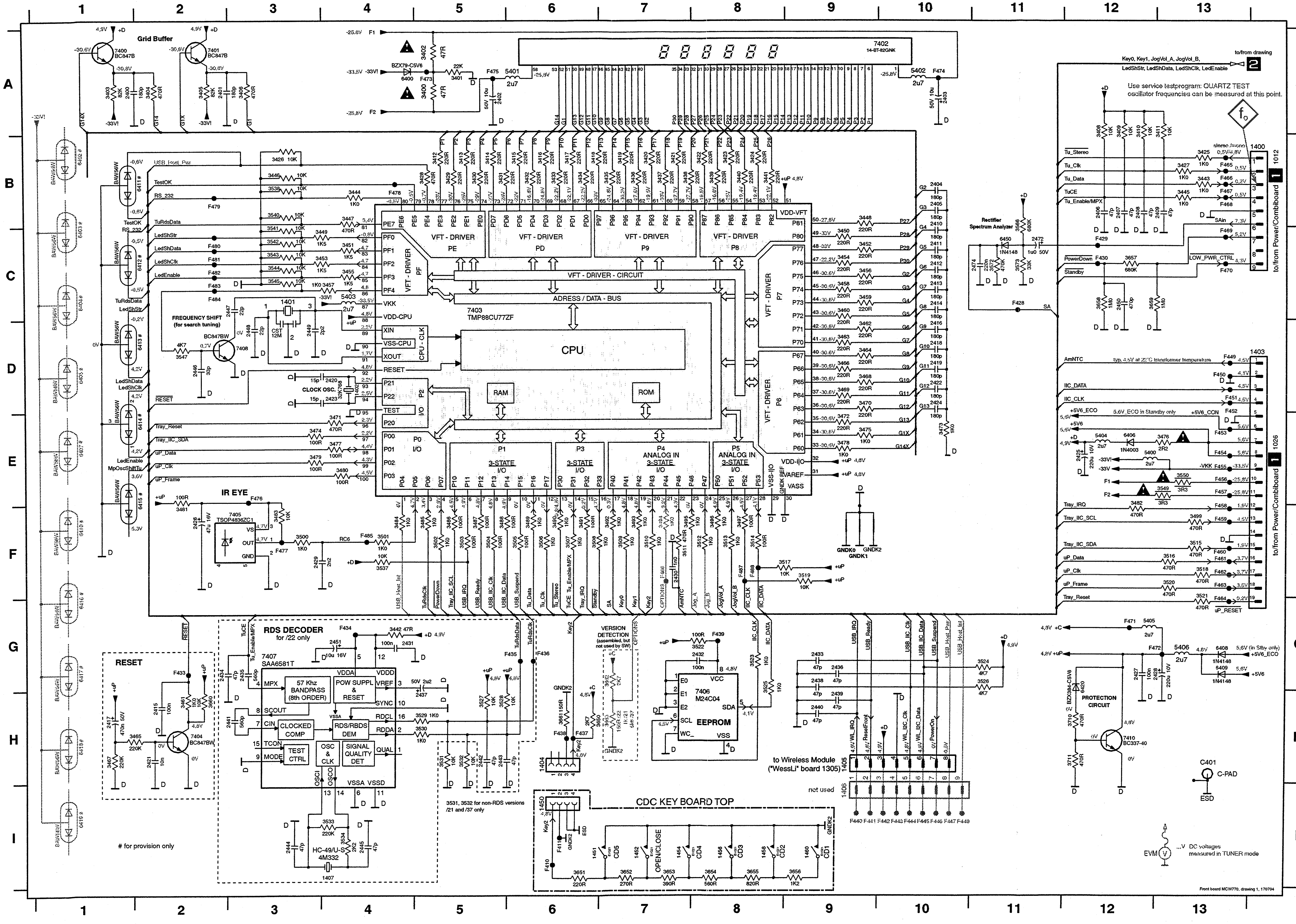
Block diagram MCW770, 190704

SET WIRING DIAGRAM


CDC KEY BOARD (top)
1450
GND_K2
KEY2
NC
NC
8011
4P/128mm/BD
3103 308 94061
1404
NC
NC
GND_K2
KEY2
FRONT BOARD
1400
TU_STEREO
TU_CLK
TU_DATA
TU_ENAB
GND_D
SA_IN
POWER_DOWN
NC
(STANDBY) LOW_PWR_CTRL
8009
9P/220mm/AD
3139 110 33651
1403
AM_NTC
GND_D
I2C_DATA
I2C_CKL
GND_D
+5V6_ECO
+5V6
+5V6
-33V
F1
F2
TRAY_IRQ
TRAY_I2C_SCL
CD_GND
TRAY_I2C_SDA
UP_DATA
UP_CLK
UP_FRAME
UP_RESET
8008
19P/180mm/AD
3139 111 02371
LIGHT BAR TOP LEFT
1445
8015
4P/88mm/AD
3103 308 94071
1415
NC
LED_DIM
NC
+5V6
LIGHT BAR TOP RIGHT
1461
8016
4P/88mm/AD
3103 308 94071
1418
NC
LED_DIM
NC
+5V6
1405
WL_IRQ
RESET_FRONT
+D
GND_D
WL_I2C_CLK
WL_I2C_DATA
POWER_ON
NOT USED
8012
1P/100mm
3103 308 94101
TO BOTTOM PLATE
8006
8P/220mm/AD
3139 110 35051
HEADPHONE BOARD
1448
HP_DET
HP_RIGHT
GND_A
HP_LEFT
0002
8007
4P/280mm/BD
3139 110 34781
8019
1P/100mm
3139 110 33891
TO BOTTOM PLATE
"WESSLI" BOARD
1305
IRQ
RESET_FRONT
+D
GND
SCL
SDA
POWER_ON
GND
LIGHT BAR WL (bottom) blue
1462
8017
4P/75mm/AD
3103 308 94081
1206
+12V_LED
NC
LED_ON
NC
COMMUNICATION LIGHT WL blue
1463
8018
4P/75mm/AD
3103 308 94081
1207
+12V_LED
NC
LED_ON
NC
1307
NOT USED
NOT USED
GND_AF
SOUND_LEFT
+12V_AF
SOUND_RIGHT
NOT USED
1500
GND_M
+12V_M
COMBI BOARD
1012
TU_STEREO
TU_CLK
TU_DATA
TU_ENAB
GND_D
SA_IN
POWER_DOWN
NC
LOW_PWR_CTRL
1026
NTC
GND_D
I2C_DATA
I2C_CKL
GND_D
+5V6_ECO
+5V6
+5V6
-VKK
F1
F2
TRAY_IRQ
TRAY_I2C_SCL
CD_GND
TRAY_I2C_SDA
UP_DATA
UP_CLK
UP_FRAME
UP_RESET
1014
HP_LEFT
GND_A
HP_RIGHT
HP_DET
1022
TP_REC_LEFT
TP_REC_RIGHT
GND_A
TP_LEFT
+12V_A
TP_RIGHT
-CMOS
8001
7P/180mm/AD
3139 110 34131
1020
GND_M
+12V_M
8014
2P/280mm
3103 308 94091
1013
TU_LEFT
GND_A
TU_RIGHT
+12V_A
TU_ENAB/MPX
TU_DATA
TU_CLK
TU_STEREO
1005
1028
1004
1006
1307
AUX IN
LINE OUT
SUBWOOFER OUT
DIGITAL OUT
LOUDSPEAKER
NOT USED IN MC-W770
8004
8P/280mm/AD
3139 111 02541
8010
1P/180mm
3139 110 36591
From screening foil (tuner socket) to screening foil (Aux. socket) on rear cabinet
ECO6 TUNER BOARD
1120
LEFT
GND
RIGHT
VCC
ENABLE/MPX
DATA
CLOCK
STEREO
1015
GND_D
UP_DATA
GND_D
UP_CLK
UP_FRAME
UC_RESET
TRAY_IRQ
TRAY_I2C_SCL
TRAY_I2C_SDA
+12V_M
GND_D
+5V_CD
CD_RIGHT
GND_A
CD_LEFT
8003
15P/480mm/BD
3139 111 02551
5DTC CD BOARD
1824
LEFT
GND_A
RIGHT
+5V
GND
+A
TRAY_I2C_SDA
TRAY_I2C_SCL
TRAY_IRQ
UC_RESET
UP_FRAME
UP_CLK
GND
UP_DATA
GND_D
8013
1P/150mm
3103 308 94111
TO BOTTOM PLATE
MP3 BOARD
1401
+FAN
GND
2P/260mm
FAN
(1104)
MAINS BOARD
1010
+AMP
+AMP
GND
GND
-AMP
-AMP
+D
GND_A
+D2
GND_SUPPLY
8303
10P/220mm
3139 110 31571
0201
+AMP
+AMP
GND
GND
-AMP
-AMP
+D
GND
+D2
GND
TRANSFORMER
PIN TYPE
STANDBY TRANSFORMER
1011
-VKK
F1
F2
POWER_DOWN
NTC
LOW_POWER_CONTROL
5V6_ECO
8005
7P/220mm/AD
3139 110 33701
1210
-VKK
F1
F2
POWER_DOWN
NTC
LOW_POWER_CONTROL
5V6_ECO
MAINS SOCKET
1204
LEGEND
FFC TOP ENTRY 1.25
FFC SIDE ENTRY 1.25
EH TOP ENTRY
EH SIDE ENTRY
DIPMATE
BOARD to BOARD JQ
PH TOP ENTRY
PH SIDE ENTRY
XH SIDE ENTRY
FLASH TOP ENTRY
FFC TOP ENTRY 1.0
FFC SIDE ENTRY 1.0
SPECIAL
CABLE 1 to n

wiring diagram MCW770, 190704

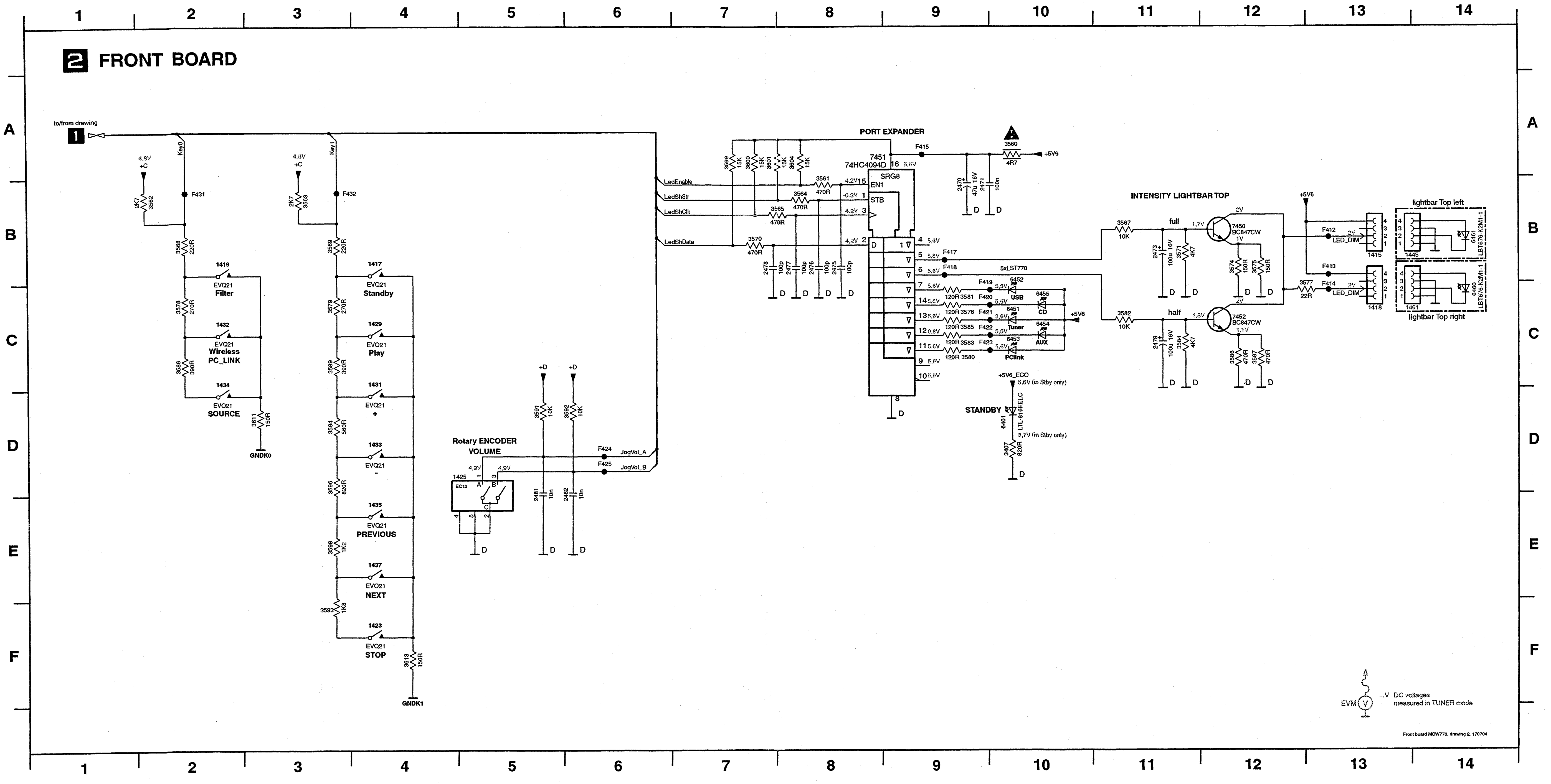
1 FRONT BOARD


Grid Buffer
7400 BC847B
7401 BC847B
7402 14-BT-82GNK
BZX79-C5V6
VFT - DRIVER PE
VFT - DRIVER PD
VFT - DRIVER P9
VFT - DRIVER P8
VFT - DRIVER PF
VFT - DRIVER P7
VFT - DRIVER P6
VFT - DRIVER - CIRCUIT
ADRESS / DATA - BUS
7403 TMP88CU77ZF
CPU
CPU - CLK
RAM
ROM
P1 3-STATE I/O
P3 3-STATE I/O
P4 ANALOG IN 3-STATE I/O
P5 ANALOG IN 3-STATE I/O
P0 I/O
P2 I/O
FREQUENCY SHIFT (for search tuning)
CLOCK OSC.
IR EYE
7405 TSOP4836ZC1
RESET
7404 BC847BW
RDS DECODER for /22 only
7407 SAA6581T
57 Khz BANDPASS (8th ORDER)
POW SUPPL & RESET
CLOCKED COMP
RDS/RBDS DEM
TEST CTRL
OSC & CLK
SIGNAL QUALITY DET
HC-49/U-S 4M332
3531, 3532 for non-RDS versions /21 and /37 only
VERSION DETECTION (assembled, but not used by SW)
7406 M24C04
EEPROM
CDC KEY BOARD TOP
OPEN/CLOSE
CD5 CD4 CD3 CD2 CD1
to Wireless Module ("WessLi" board 1305)
not used
PROTECTION CIRCUIT
7410 BC337-40
C401 C-PAD
ESD
Rectifier Spectrum Analyzer
Use service testprogram: QUARTZ TEST oscillator frequencies can be measured at this point.
Key0, Key1, JogVol_A, JogVol_B, LedShStr, LedShData, LedShClk, LedEnable
to/from drawing 2
to/from Power/Combiboard 1 1012
to/from Power/Combiboard 1 1026
typ. 4.5V at 25°C transformer temperature
5.6V_ECO in Standby only
# for provision only
...V DC voltages measured in TUNER mode
EVM
Front board MCW770, drawing 1, 170704
1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I

1400	B13
1401	C3
1402	D4
1403	D13
1404	H6
1405	H9
1406	I9
1407	I4
1450	I6
1451	I7
1452	I7
1454	I7
1456	I8
1458	I8
1460	I9
2400	A1
2401	A2
2402	A5
2403	A10
2404	B10
2405	B10
2406	B12
2407	B12
2408	B12
2409	B13
2410	B10
2411	C10
2412	C10
2413	C10
2414	C10
2415	H2
2416	D10
2417	H1
2418	D10
2419	D10
2420	D4
2421	H2
2422	D10
2423	D4
2424	D10
2425	E12
2426	F2
2427	G12
2428	G13
2429	F3
2430	F7
2431	G4
2432	G8
2433	G9
2434	G2
2435	G3
2436	G9
2437	H5
2438	G9
2439	H9
2440	H9
2441	H3
2442	H5
2443	H5
2444	I3
2445	I4
2446	D2
2447	C3
2448	D3
2449	D3
2450	C12
2451	G4
2472	C11
2474	C11
3400	A5
3401	A5
3402	A5
3403	A1
3404	A2
3405	A2
3406	A3
3408	A12
3409	A12
3410	A12
3411	A13
3412	B5
3413	B5
3414	B5
3415	B6
3416	B6
3417	B6
3418	B6
3419	B7
3420	B7
3421	B7
3422	B8
3423	B8
3424	B8
3425	B13
3426	B3
3427	B13
3428	B5
3429	B5
3430	B5
3431	B5
3432	B6
3433	B6
3434	B6
3435	B7
3436	B7
3437	B7
3438	B7
3439	B8
3440	B8
3441	B8
3442	G4
3443	B13
3444	B4
3445	B13
3446	B3
3447	B4
3448	B9
3449	C3
3450	C9
3451	C4
3452	C9
3453	C3
3454	C9
3455	C4
3456	C9
3457	C4
3458	C9
3459	C9
3460	C9
3461	H2
3462	D9
3463	D9
3464	D9
3465	H1
3466	D9
3467	H1
3468	D9
3469	D9
3470	D9
3471	E4
3472	E9
3473	E11
3474	E3
3475	E9
3476	E13
3477	E4
3478	E9
3479	E3
3480	E4
3481	F2
3482	F12
3483	F3
3484	F4
3485	F5
3486	F5
3487	F5
3488	F5
3489	F6
3490	F6
3491	F6
3492	F7
3493	F7
3494	F7
3495	F7
3496	F8
3497	F8
3499	F13
3500	F3
3501	F4
3502	F5
3503	F5
3504	F5
3505	F6
3506	F6
3507	F6
3508	F6
3509	F7
3510	F7
3512	F7
3513	F8
3514	F8
3515	F13
3516	F13
3517	F8
3518	F13
3519	F9
3520	F13
3521	G13
3522	G8
3523	G8
3524	G11
3525	G8
3526	G11
3527	H5
3528	H5
3529	H5
3530	H5
3531	H5
3532	H5
3533	I4
3534	I4
3537	F4
3538	B3
3540	B3
3541	C3
3542	C3
3543	C3
3544	C3
3545	C3
3547	D2
3549	E13
3550	E13
3566	C11
3572	C11
3573	C11
3650	H6
3651	I6
3652	I7
3653	I7
3654	I8
3655	I8
3656	I9
3657	C12
3658	C12
3659	C12
3660	H2
3661	H6
3662	G7
3663	H7
3710	H11
3711	H11
5400	E12
5401	A6
5402	A10
5403	C4
5404	E12
5405	G12
5406	G13
6400	A4
6402	B1
6403	C1
6404	C1
6405	D1
6406	E12
6407	E1
6408	G13
6409	G13
6410	F1
6411	B2
6412	C2
6413	D2
6414	E2
6415	E2
6416	G1
6417	G1
6418	H1
6419	I1
6420	G11
6450	C11
7400	A1
7401	A2
7402	A10
7403	C5
7404	H2
7405	F3
7406	H8
7407	G3
7408	D3
7410	H12
C401	H13
F428	C11
F429	C12
F430	C12
F433	G2
F434	G4
F435	G6
F436	G6
F437	H6
F438	H6
F439	G8
F440	I9
F441	I9
F442	I10
F443	I10
F444	I10
F445	I10
F446	I10
F447	I10
F448	I10
F449	D13
F450	D13
F451	D13
F452	E13
F453	E13
F454	E13
F455	E13
F456	E13
F457	E13
F458	F13
F459	F13
F460	F13
F461	F13
F462	F13
F463	F13
F464	G13
F465	B13
F466	B13
F467	B13
F468	B13
F469	C13
F470	C13
F471	G12
F472	G12
F473	A5
F474	A10
F475	A5
F476	E3
F477	F3
F478	B4
F479	B2
F480	C2
F481	C2
F482	C2
F483	C2
F484	C2
F485	F5
F486	F7
F487	F8
F488	F8

1415	B13
1417	B4
1418	C13
1419	B2
1423	F4
1425	D4
1429	C4
1431	C4
1432	C2
1433	D4
1434	C2
1435	E4
1437	E4
2470	B9
2471	B9
2473	B11
2475	B8
2476	B8
2477	B8
2478	B7
2479	C11
2481	D5
2482	D6
3407	D10
3560	A10
3561	B8
3562	B2
3563	B3
3564	B8
3565	B7
3567	B11
3568	B2
3569	B3
3570	B7
3571	B11
3574	B12
3575	B12
3576	C9
3577	C12
3578	C2
3579	C3
3580	C9
3581	C9
3582	C11
3583	C9
3584	C11
3585	C9
3586	C12
3587	C12
3588	C2
3589	C3
3591	D5
3592	D6
3593	F3
3594	D3
3596	D3
3598	E3
3599	A7
3600	A7
3601	A7
3604	A8
3611	D3
3613	F4
6401	D10
6451	C10
6452	B10
6453	C10
6454	C10
6455	C10
6460	C14
6461	B14
7450	B12
7451	B8
7452	C12
F412	B13
F413	B13
F414	C13
F415	A9
F417	B9
F418	B9
F419	C10
F420	C10
F421	C10
F422	C10
F423	C10
F424	D6
F425	D6
F431	B2
F432	B3

2 FRONT BOARD

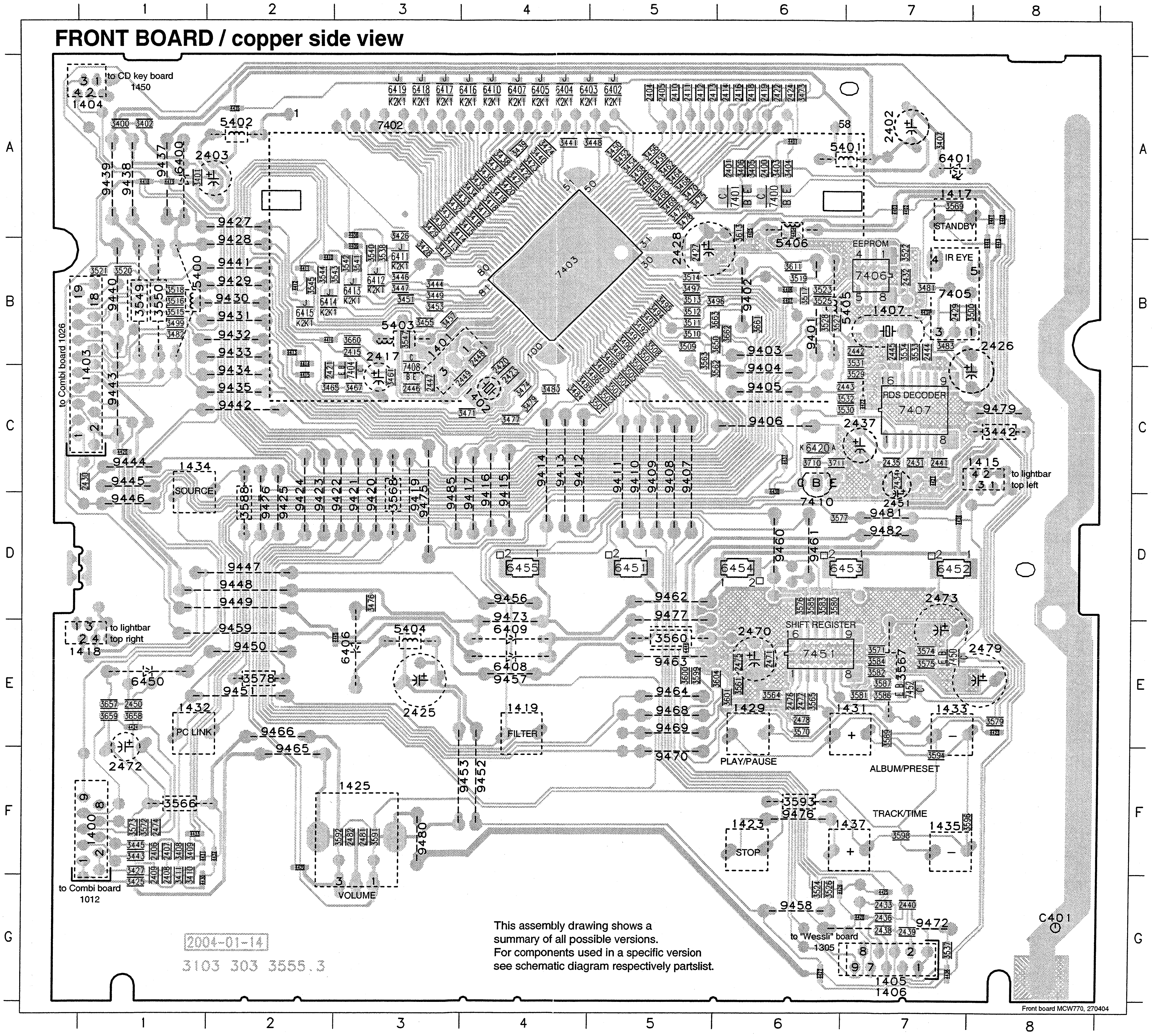


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
to/from drawing
1
Key0
Key1
4,8V
+C
2K7
3562
3563
F431
F432
3568
220R
3569
220R
1419
EVQ21
Filter
3578
270R
1432
EVQ21
Wireless
PC_LINK
3588
390R
1434
EVQ21
SOURCE
3611
150R
GNDK0
1417
EVQ21
Standby
3579
270R
1429
EVQ21
Play
3589
390R
1431
EVQ21
+
3594
560R
1433
EVQ21
-
3596
820R
1435
EVQ21
PREVIOUS
3598
1K2
1437
EVQ21
NEXT
3593
1K8
1423
EVQ21
STOP
3613
150R
GNDK1
Rotary ENCODER
VOLUME
1425
EC12
4,9V
A
B
C
+D
3591
10K
3592
10K
2481
10n
2482
10n
F424
JogVol_A
F425
JogVol_B
D
LedEnable
LedShStr
LedShClk
LedShData
PORT EXPANDER
3599
3600
3601
3604
15K
3561
470R
3564
470R
3565
470R
3570
470R
2478
2477
2476
2475
100p
7451
74HC4094D
SRG8
EN1
STB
4,2V
-0,3V
5,6V
0,8V
3,6V
F415
3560
4R7
+5V6
2470
47u 16V
2471
100n
F417
F418
5xLST770
F419
F420
F421
F422
F423
120R
3581
3576
3585
3583
3580
6452
USB
6455
CD
6451
Tuner
6454
AUX
6453
PClink
+5V6_ECO
5,6V (in Stby only)
STANDBY
6401
LTL-816EELC
3,7V (in Stby only)
3407
820R
INTENSITY LIGHTBAR TOP
3567
10K
full
1,7V
2473
100u 16V
3571
4K7
7450
BC847CW
2V
1V
3574
150R
3575
150R
3582
10K
half
1,8V
2479
100u 16V
3584
4K7
7452
BC847CW
1,1V
3586
470R
3587
470R
3577
22R
F412
F413
F414
LED_DIM
1415
1418
lightbar Top left
1445
6461
LBT676-K2M1-1
1461
6460
lightbar Top right
EVM
V
...V DC voltages
measured in TUNER mode
Front board MCW770, drawing 2, 170704

SMD COMPONENTS

2400	A6	3475	A5	4414	B2
2401	A6	3476	D3	4415	C2
2404	A5	3477	C4	4416	B2
2405	A5	3478	A5	4418	A1
2406	F1	3479	C4	4419	A1
2407	F1	3480	C4	4420	C1
2408	G1	3481	B7	4421	C7
2409	G1	3482	B1	4422	C7
2410	A5	3483	B7	4423	E8
2411	A5	3484	C4	4424	E1
2412	A5	3485	C4	4425	G7
2413	A5	3486	C5	4426	G6
2414	A6	3487	C5	4427	G6
2415	B3	3488	B5	4428	G7
2416	A6	3489	B5	4429	F2
2418	A6	3490	B5	4430	G1
2419	A6	3491	B5	4431	F1
2420	C4	3492	B5	4432	F2
2421	C2	3493	B5	4433	F1
2422	A6	3494	B5	4434	B7
2423	C4	3495	B5	4435	A2
2424	A6	3496	B5	4436	G7
2427	B5	3497	B5	4437	C6
2429	B7	3499	B1	4438	C6
2430	C1	3500	B7	4439	D7
2431	C7	3501	C5	4441	A8
2432	B7	3502	C5	4442	A8
2433	G7	3503	C5	4443	B8
2434	C7	3504	C5	4444	B8
2435	C7	3505	C5	4445	E2
2436	G7	3506	C5	4446	E5
2438	G7	3507	B5	6402	A5
2439	G7	3508	B5	6403	A4
2440	G7	3509	B5	6404	A4
2441	C7	3510	B5	6405	A4
2442	B7	3511	B5	6407	A4
2443	C6	3512	B5	6410	A4
2444	B7	3513	B5	6411	B3
2445	B7	3514	B5	6412	B3
2446	C3	3515	B1	6413	B3
2447	C3	3516	B1	6414	B2
2448	B4	3517	B6	6415	B2
2449	C4	3518	B1	6416	A4
2450	E1	3519	B6	6417	A3
2471	E6	3520	B1	6418	A3
2474	F1	3521	B1	6419	A3
2475	E6	3522	B7	6420	C6
2476	E6	3523	B6	6451	D5
2477	E6	3524	G6	6452	D7
2478	E6	3525	B6	6453	D7
2481	F3	3526	G6	6454	D6
2482	F3	3527	B6	6455	D4
3400	A1	3528	B6	7400	A6
3401	A1	3529	C7	7401	A6
3402	A1	3530	C6	7403	B4
3403	A6	3531	B7	7404	C3
3404	A6	3532	C6	7406	B7
3405	A6	3533	B7	7407	C7
3406	A6	3534	B7	7408	C3
3407	A7	3537	G7	7450	E7
3408	F1	3538	B3	7451	E6
3409	F1	3540	B3	7452	E7
3410	G1	3541	B3		
3411	G1	3542	B3		
3412	B3	3543	B2		
3413	B3	3544	B2		
3414	A3	3545	B2		
3415	A4	3547	B3		
3416	A4	3561	E6		
3417	A4	3562	C5		
3418	A4	3563	B5		
3419	A4	3564	E6		
3420	A4	3565	E6		
3421	A4	3569	A7		
3422	A4	3570	E6		
3423	A4	3571	E7		
3424	A4	3572	F1		
3425	G1	3573	F1		
3426	A3	3574	E7		
3427	F1	3575	E7		
3428	B3	3576	D6		
3429	A3	3577	D6		
3430	A3	3579	E8		
3431	A3	3580	D6		
3432	A3	3581	E7		
3433	A3	3582	E7		
3434	A4	3583	D6		
3435	A4	3584	E7		
3436	A4	3585	D6		
3437	A4	3586	E7		
3438	A4	3587	E7		
3439	A4	3589	E7		
3440	A4	3591	F3		
3441	A4	3592	F3		
3443	F1	3594	F7		
3444	B3	3596	F7		
3445	F1	3598	F7		
3446	B3	3599	E5		
3447	B3	3600	E5		
3448	A5	3601	E6		
3449	B3	3604	E6		
3450	A5	3611	B6		
3451	B3	3613	A6		
3452	A5	3650	B5		
3453	B3	3657	E1		
3454	A5	3658	E1		
3455	B3	3659	E1		
3456	A5	3660	B3		
3457	B3	3661	B6		
3458	A5	3662	B6		
3459	A5	3663	B5		
3460	A5	3710	C6		
3461	C3	3711	C6		
3462	A5	4401	A6		
3463	A5	4402	A7		
3464	A5	4403	A7		
3465	C2	4404	A6		
3466	A5	4405	A6		
3467	C3	4406	B6		
3468	A5	4407	B6		
3469	A5	4408	A3		
3470	A5	4409	B3		
3471	C4	4410	B2		
3472	A5	4411	B2		
3473	A6	4412	B2		
3474	C4	4413	B2		

FRONT BOARD / copper side view


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
to CD key board
1450
1404
to Combi board 1026
1403
to lightbar
top right
1418
to Combi board
1012
1400
SOURCE
1434
PC LINK
1432
VOLUME
1425
FILTER
1419
PLAY/PAUSE
1429
ALBUM/PRESET
1431
1433
TRACK/TIME
1437
1435
STOP
1423
to "Wessli" board
1305
1405
1406
EEPROM
7406
STANDBY
1417
IR EYE
7405
RDS DECODER
7407
to lightbar
top left
1415
SHIFT REGISTER
7451
7402
7403
C401
2004-01-14
3103 303 3555.3

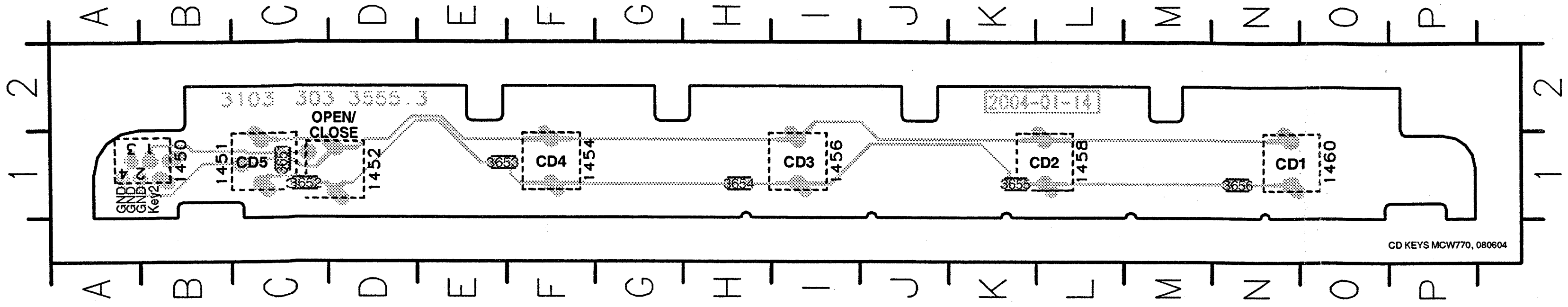
This assembly drawing shows a
summary of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

Front board MCW770, 270404

WIRED COMPONENTS

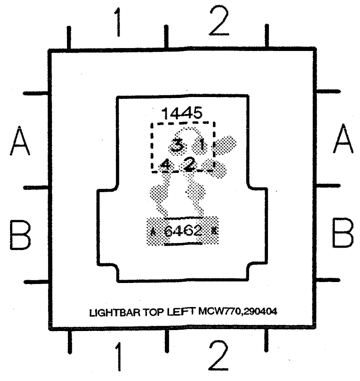
1400	F1	9473	E4
1401	B3	9475	D3
1402	C4	9476	F6
1403	C1	9477	D5
1404	A1	9479	C8
1405	G7	9480	F3
1406	G7	9481	D7
1407	B7	9482	D7
1415	C8	9485	D3
1417	A7	C401	G8
1418	E1		
1419	E4		
1423	F6		
1425	F3		
1429	E6		
1431	E7		
1432	E1		
1433	E7		
1434	C1		
1435	F7		
1437	F7		
2402	A7		
2403	A1		
2417	C3		
2425	E3		
2426	C7		
2428	B5		
2437	C6		
2451	C7		
2470	E6		
2472	E1		
2473	D7		
2479	E8		
3442	C8		
3549	B1		
3550	B1		
3560	E5		
3566	F1		
3567	E7		
3568	D3		
3578	E2		
3588	D2		
3593	F6		
5400	B1		
5401	A6		
5402	A2		
5403	B3		
5404	E3		
5405	B7		
5406	B6		
6400	A1		
6401	A7		
6406	E3		
6408	E4		
6409	E4		
6450	E1		
7402	A2		
7405	B7		
7410	C6		
9401	B6		
9402	B6		
9403	B6		
9404	C6		
9405	C6		
9406	C6		
9407	C5		
9408	C5		
9409	C5		
9410	C5		
9411	C5		
9412	C4		
9413	C4		
9414	C4		
9415	C4		
9416	C4		
9417	D4		
9419	D3		
9420	D3		
9421	D3		
9422	D3		
9423	D2		
9424	D2		
9425	D2		
9426	D2		
9427	A2		
9428	B2		
9429	B2		
9430	B2		
9431	B2		
9432	B2		
9433	B2		
9434	C2		
9435	C2		
9437	A1		
9438	A1		
9439	A1		
9440	B1		
9441	B2		
9442	C2		
9443	C1		
9444	C1		
9445	C1		
9446	D1		
9447	D2		
9448	D2		
9449	D2		
9450	E2		
9451	E2		
9452	F4		
9453	F4		
9456	D4		
9457	E4		
9458	G6		
9459	E2		
9460	D6		
9461	D6		
9462	D5		
9463	E5		
9464	E5		
9465	F2		
9466	E2		
9468	E5		
9469	E5		
9470	F5		
9472	G7		

CDC KEY BOARD top / copper side view

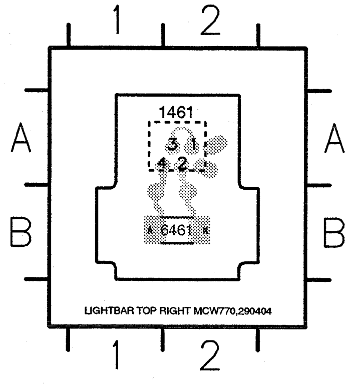

A B C D E F G H I J K L M N O P
1 2
3103 303 3555.3
2004-01-14
OPEN/
CLOSE
CD5
CD4
CD3
CD2
CD1
1450
1451
1452
1454
1456
1458
1460
3651
3652
3653
3654
3655
3656
GND
GND
Key1
Key2
CD KEYS MCW770, 080604

1450	A1
1451	C1
1452	D1
1454	F1
1456	I1
1458	L1
1460	O1
3651	C1
3652	C1
3653	E1
3654	H1
3655	K1
3656	N1

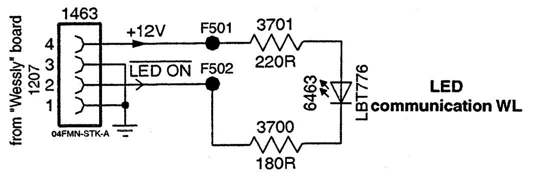
LIGHTBAR top left / copper side view


1 2
A B
1445
3 1
4 2
6462
LIGHTBAR TOP LEFT MCW770,290404

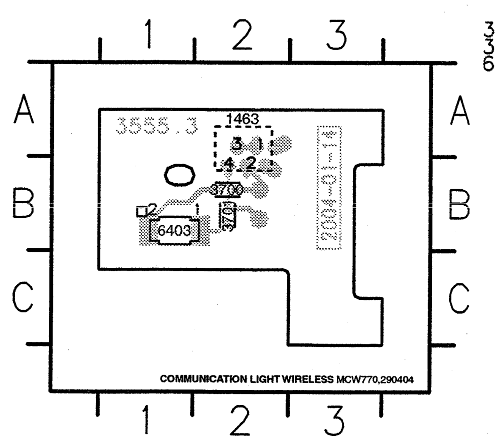
LIGHTBAR top right / copper side view


1 2
A B
1461
3 1
4 2
6461
LIGHTBAR TOP RIGHT MCW770,290404

COMMUNICATION LIGHT WIRELESS

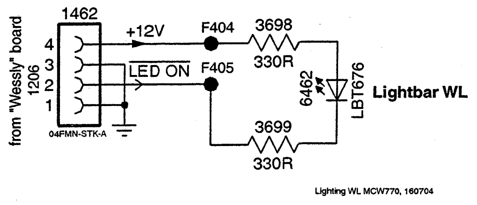

from "Wessly" board
1207
1463
4
3
2
1
04FMN-STK-A
+12V
LED ON
F501
F502
3701
220R
3700
180R
6463
LBT776
LED
communication WL

COMMUNICATION LIGHT WL / copper side view

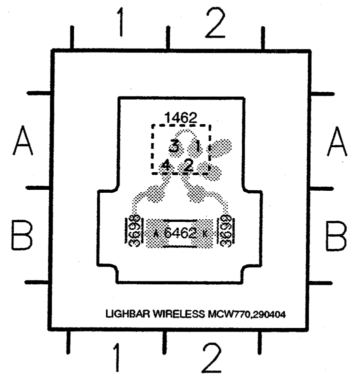

1 2 3
A B C
3555.3
1463
3 1
4 2
3700
3701
6403
2004-01-14
COMMUNICATION LIGHT WIRELESS MCW770,290404

3700	B2
3701	B2
6463	B1

LIGHT BAR WIRELESS


from "Wessly" board
1206
1462
4
3
2
1
04FMN-STK-A
+12V
LED ON
F404
F405
3698
330R
3699
330R
6462
LBT676
Lightbar WL
Lighting WL MCW770, 160704

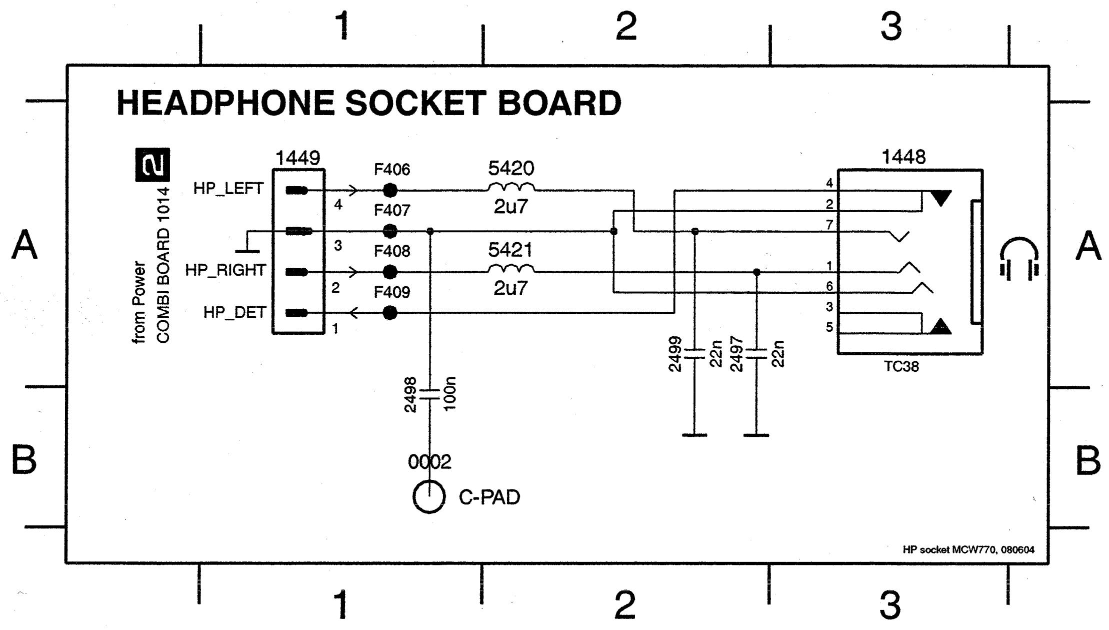
LIGHTBAR WL / copper side view


1 2
A B
1462
3 1
4 2
3698
6462
3699
LIGHBAR WIRELESS MCW770,290404

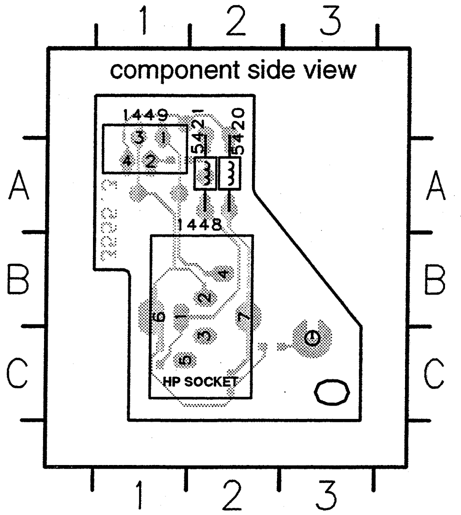
1462	A1
3698	B1
3699	B2
6462	B2

0002 B1	1449 A1	2498 B1	5420 A2	F406 A1	F408 A1
1448 A3	2497 A2	2499 A2	5421 A2	F407 A1	F409 A1

HEADPHONE SOCKET BOARD

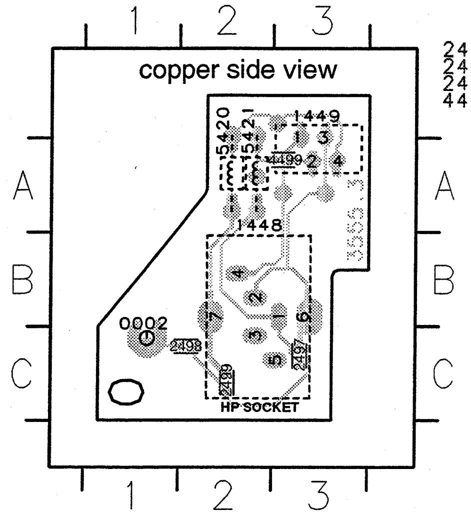

1 2 3
A B
2
from Power
COMBI BOARD 1014
HP_LEFT
HP_RIGHT
HP_DET
1449
4
3
2
1
F406
F407
F408
F409
5420
2u7
5421
2u7
2498
100n
2499
22n
2497
22n
0002
C-PAD
1448
TC38
HP socket MCW770, 080604

HEADPHONE BOARD

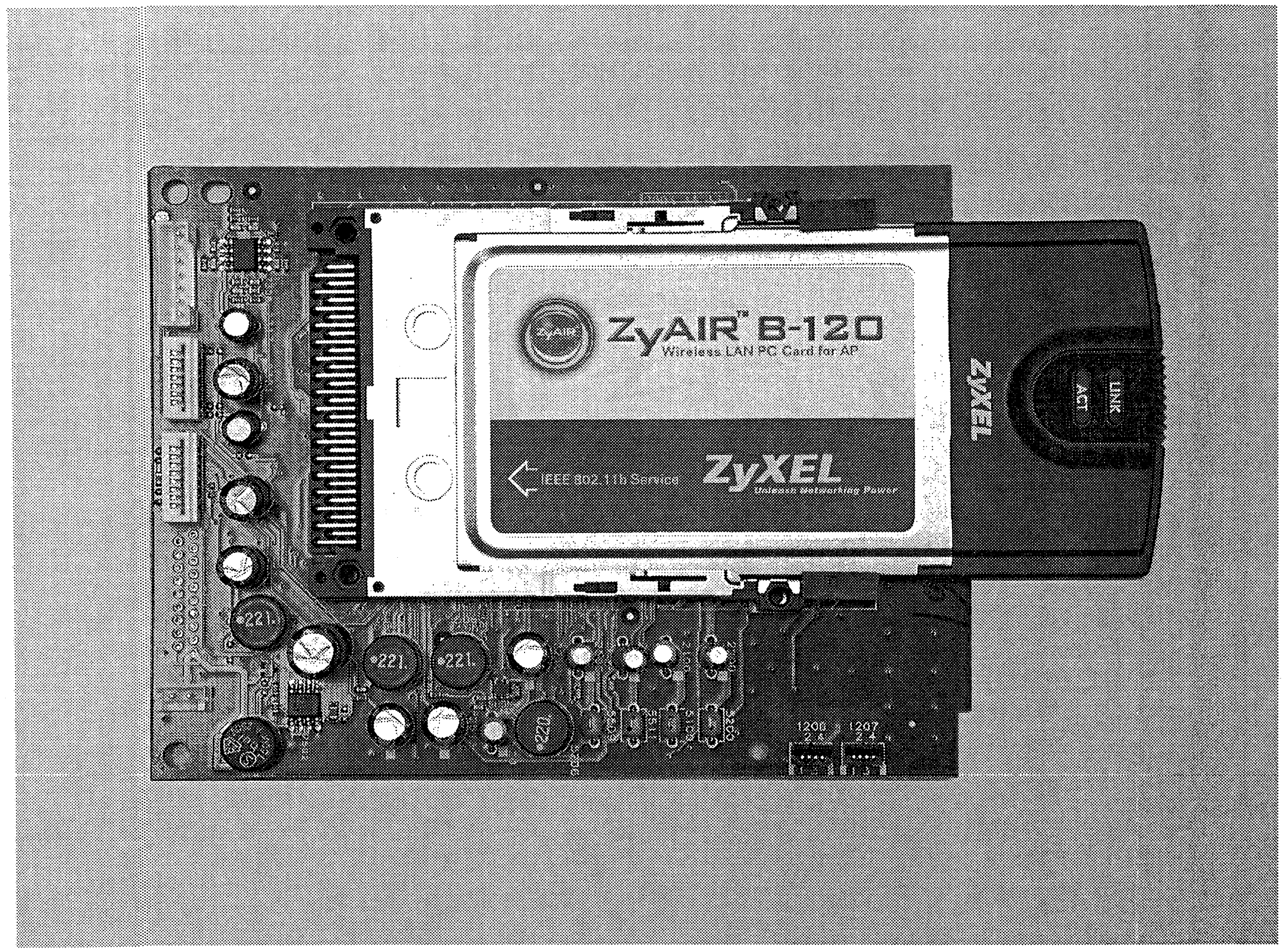

1 2 3
A B C
component side view
1449
3 1
4 2
5421
5420
1448
HP SOCKET

0002	B3
1448	B2
1449	A1
5420	A2
5421	A2

HP BOARD MCW770,080604


1 2 3
A B C
copper side view
5420
5421
1449
1 3
4499
2 4
1448
3555.3
0002
2498
2499
2497
HP SOCKET

2497	C3
2498	C2
2499	C2
4499	A3


ZyAIR B-120
Wireless LAN PC Card for AP
IEEE 802.11b Service
ZyXEL
Unleash Networking Power
LINK
ACT
221
1208
1207

Wessli Module

This module is not intended to be repaired on component level.
Circuit Diagrams and Assembly Drawings are published for orientation only.

In case of defects please replace
the entire Printed Board respectively the Wireless LAN Card.

Parts can be ordered as follows:

3103 308 67861..........Printed Board Assembly Wessli (all versions)
2822 062 41028..........Wireless LAN Card WMOD WIFIB PCC2 B-120 US B (for /21/37)
2822 062 41031..........Wireless LAN Card WMOD WIFIB PCC2 B-120 EU B (for /22)

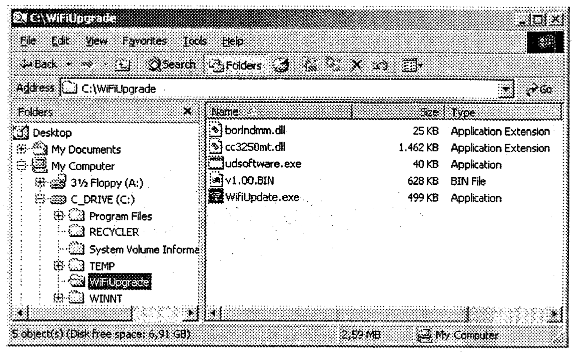
Wessli Module – Firmware Upgrade

The firmware of the Wessli Module can be upgraded via wireless network. The network is used to transfer the new firmware from the PC to the on-board Flash-ROM (IC 7103). Firmware and related tools are usually distributed as zip-archive.

To upgrade the firmware of the Wessli Module proceed as follows:

1. Insert the MCW770 Setup-CD into the CD-drive of the PC and walk through the consumer installation.

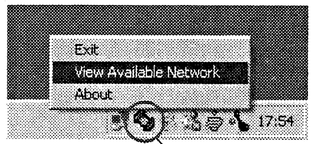
2. Create a new folder "WiFiUpgrade" on the PC hard disk and extract the content of the supplied zip-archive to this location. The folder should contain the following files:


C:\WiFiUpgrade
File Edit View Favorites Tools Help
Back Search Folders Go
Address C:\WiFiUpgrade
Folders
Desktop
My Documents
My Computer
3½ Floppy (A:)
C_DRIVE (C:)
Program Files
RECYCLER
System Volume Informa
TEMP
WiFiUpgrade
WINNT

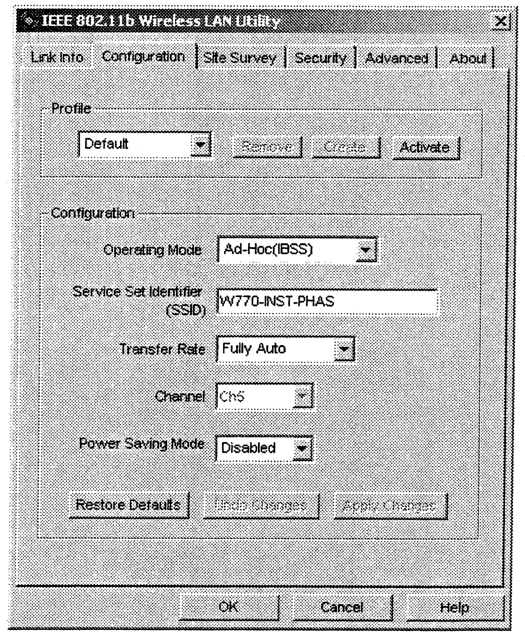
Name	Size	Type
borlndmm.dll	25 KB	Application Extension
cc3250mt.dll	1.462 KB	Application Extension
udsoftware.exe	40 KB	Application
v1.00.BIN	628 KB	BIN File
WifiUpdate.exe	499 KB	Application

5 object(s) (Disk free space: 6,91 GB) 2,59 MB My Computer

3. Open the Wireless LAN Utility via WiFi icon in the system tray (right-click the icon and click on "View Available Network").

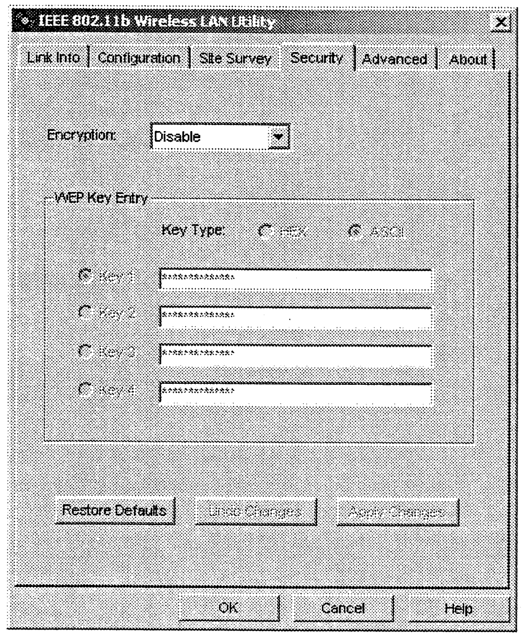

Exit
View Available Network
About
17:54
WiFi icon

4. Apply the following settings in the configuration tab:


IEEE 802.11b Wireless LAN Utility
Link Info
Configuration
Site Survey
Security
Advanced
About
Remove
Create
Activate
Restore Defaults
Undo Changes
Apply Changes
OK
Cancel
Help

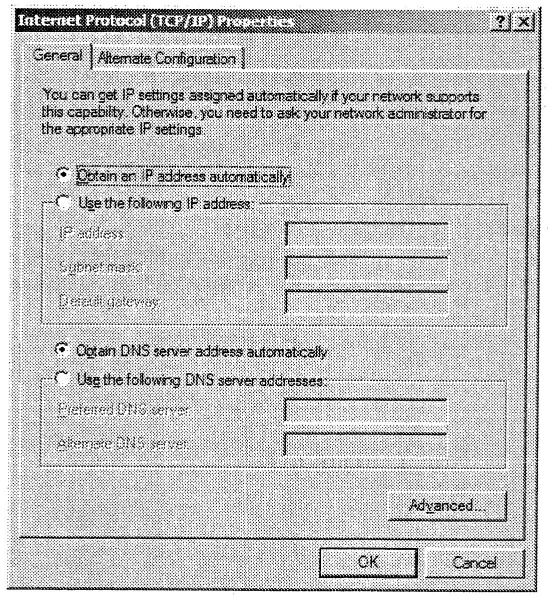
Profile: Default
Operating Mode: Ad-Hoc(IBSS)
Service Set Identifier (SSID): W770-INST-PHAS
Transfer Rate: Fully Auto
Channel: Ch5
Power Saving Mode: Disabled

5. Disable encryption in the security tab:


IEEE 802.11b Wireless LAN Utility
Link Info
Configuration
Site Survey
Security
Advanced
About
Restore Defaults
Undo Changes
Apply Changes
OK
Cancel
Help

Encryption: Disable
WEP Key Entry
Key Type: ○ HEX ● ASCII
● Key 1 **************
○ Key 2 **************
○ Key 3 **************
○ Key 4 **************

6. Open the "TCP/IP properties" in "Windows Network and Dial-up Connections" and ensure that "Obtain an IP address automatically" is selected.

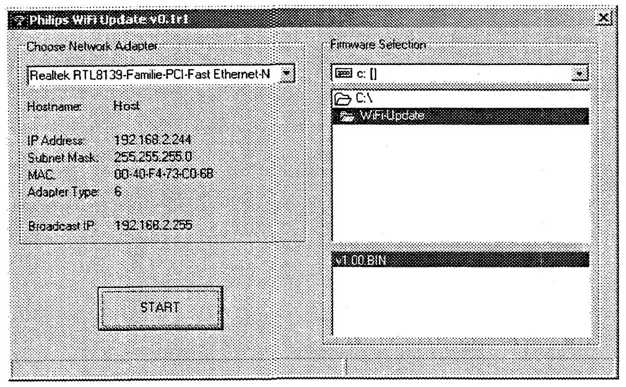

Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
Advanced...
OK
Cancel

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically
○ Use the following IP address:
IP address:
Subnet mask:
Default gateway:
● Obtain DNS server address automatically
○ Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:

7. Put the MCW770 into Installation mode as follows:
   - Hold the PC-LINK button depressed for at least 5s.
   - The display shows "INSTALLING".
   - Wait for another 15s.
   - Hold the BROWSE button depressed for at least 2s.
   - Wait for another 15s.
   - The display shows "EXPERT INSTALL" and the color of the WiFi icon in the system tray turns to green.
   - Wait for another 90s to ensure that the set has optained its IP address.

8. Run “WiFiUpdate.exe“ from the folder created in step 2 and mark the firmware upgrade file inside this folder.


Philips WiFi Update v0.1r1
Choose Network Adapter
Firmware Selection
START

Realtek RTL8139-Familie-PCI-Fast Ethernet-N

Hostname: Host

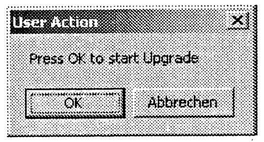
IP Address: 192.168.2.244
Subnet Mask: 255.255.255.0
MAC: 00-40-F4-73-C0-6B
Adapter Type: 6

Broadcast IP: 192.168.2.255

c: []
C:\
WiFi-Update

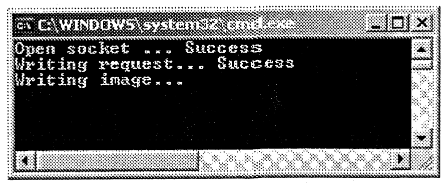
v1.00.BIN

9. Finally, start the firmware upgrade as follows:
   - Click the START button in the WiFi Upgrade utility.
   - Dialog “Press OK to start Upgrade” pops up.


User Action
OK
Abbrechen

Press OK to start Upgrade

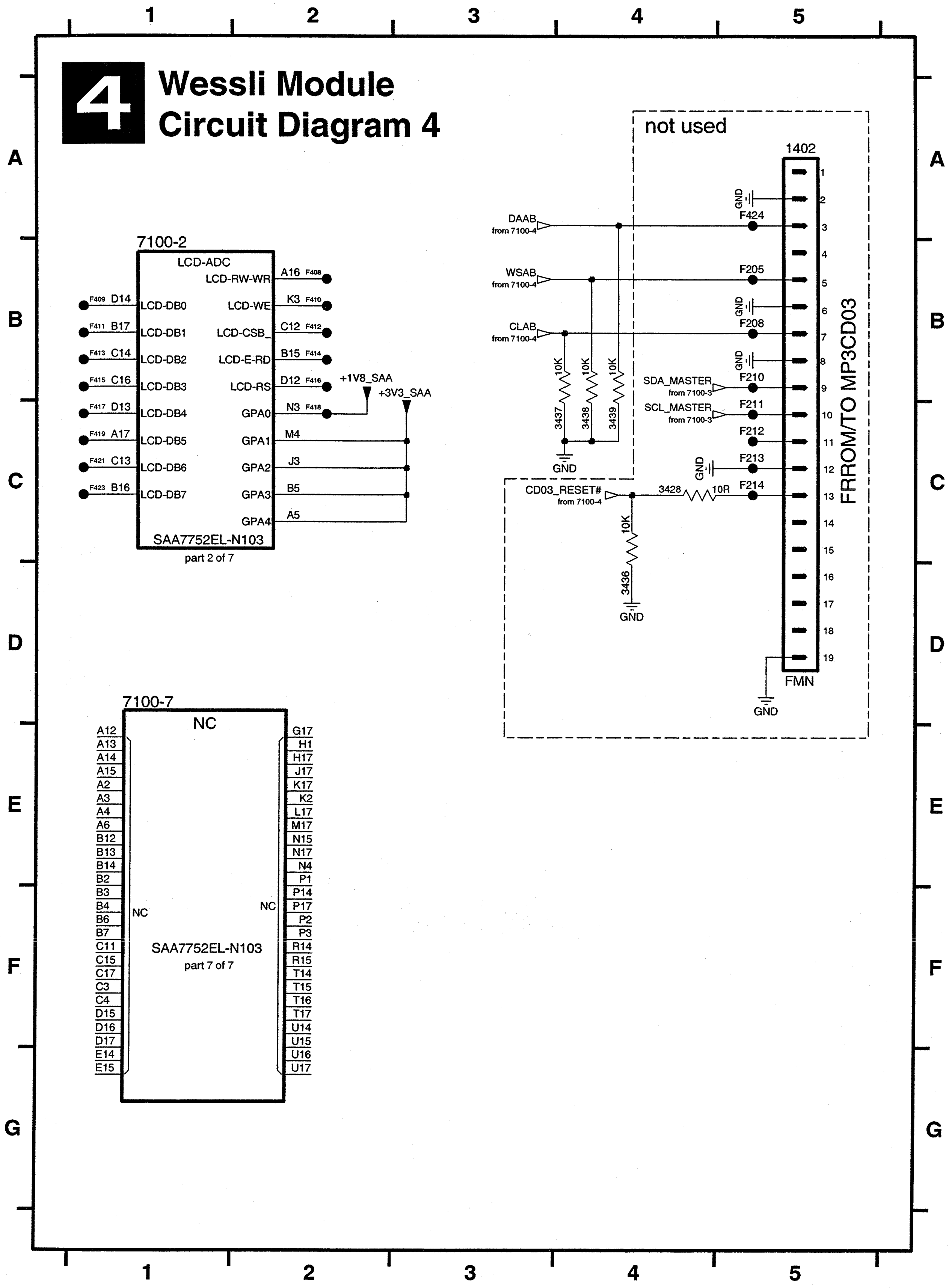
   - Click the OK button.
   - A command window opens and shows:


C:\WINDOWS\system32\cmd.exe

```
Open socket ... Success
Writing request... Success
Writing image...
```

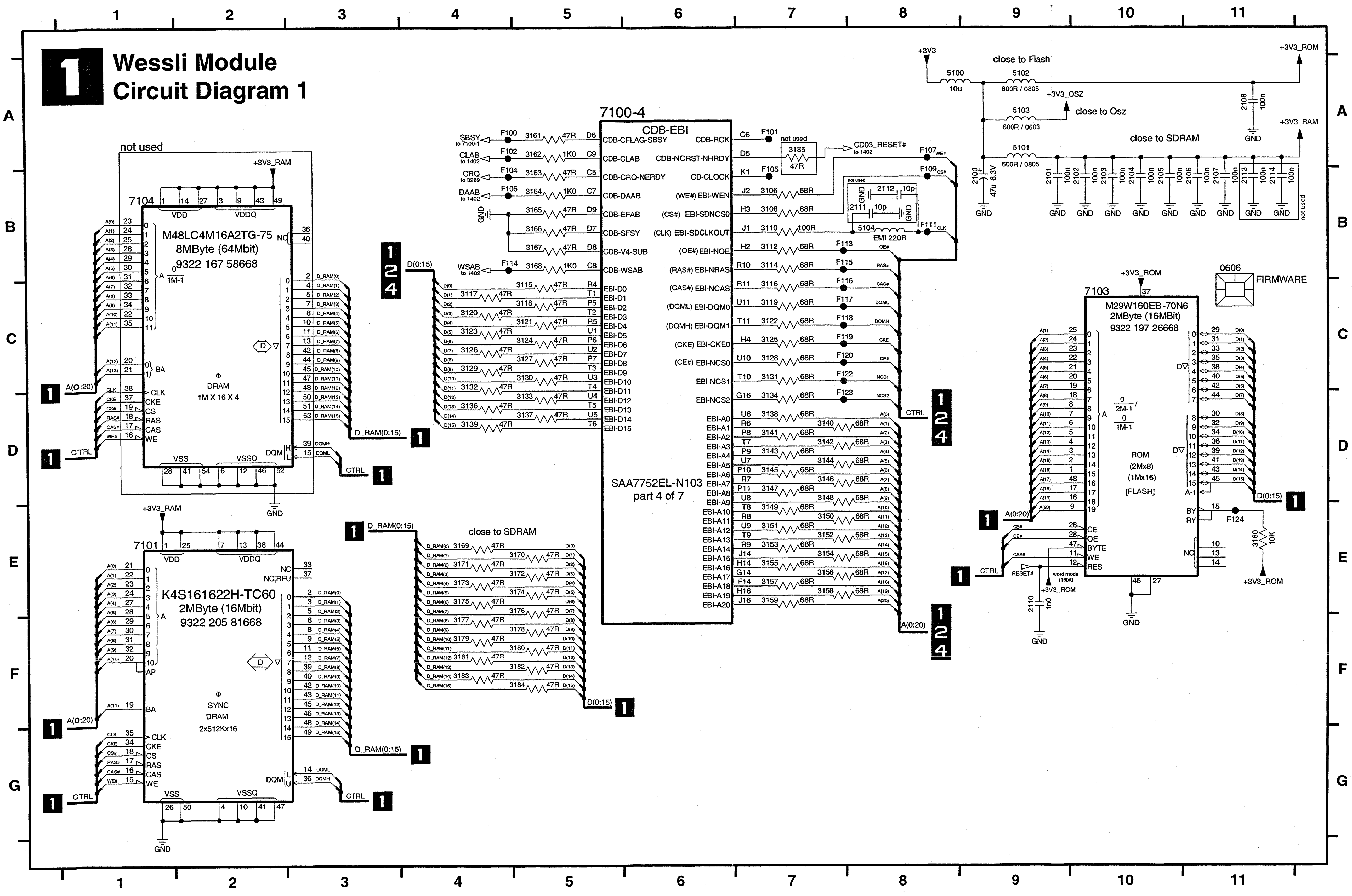
   - The display on the set shows “PRESS PLAY TO UPGRADE PROG”.
   - Press the PLAY button on the set.
   - After a few seconds the upgrade utility reports “Upgrade successful” and the display on the set shows “COMPLETED”.
   - Disconnect the set from the mains supply

4 Wessli Module Circuit Diagram 4

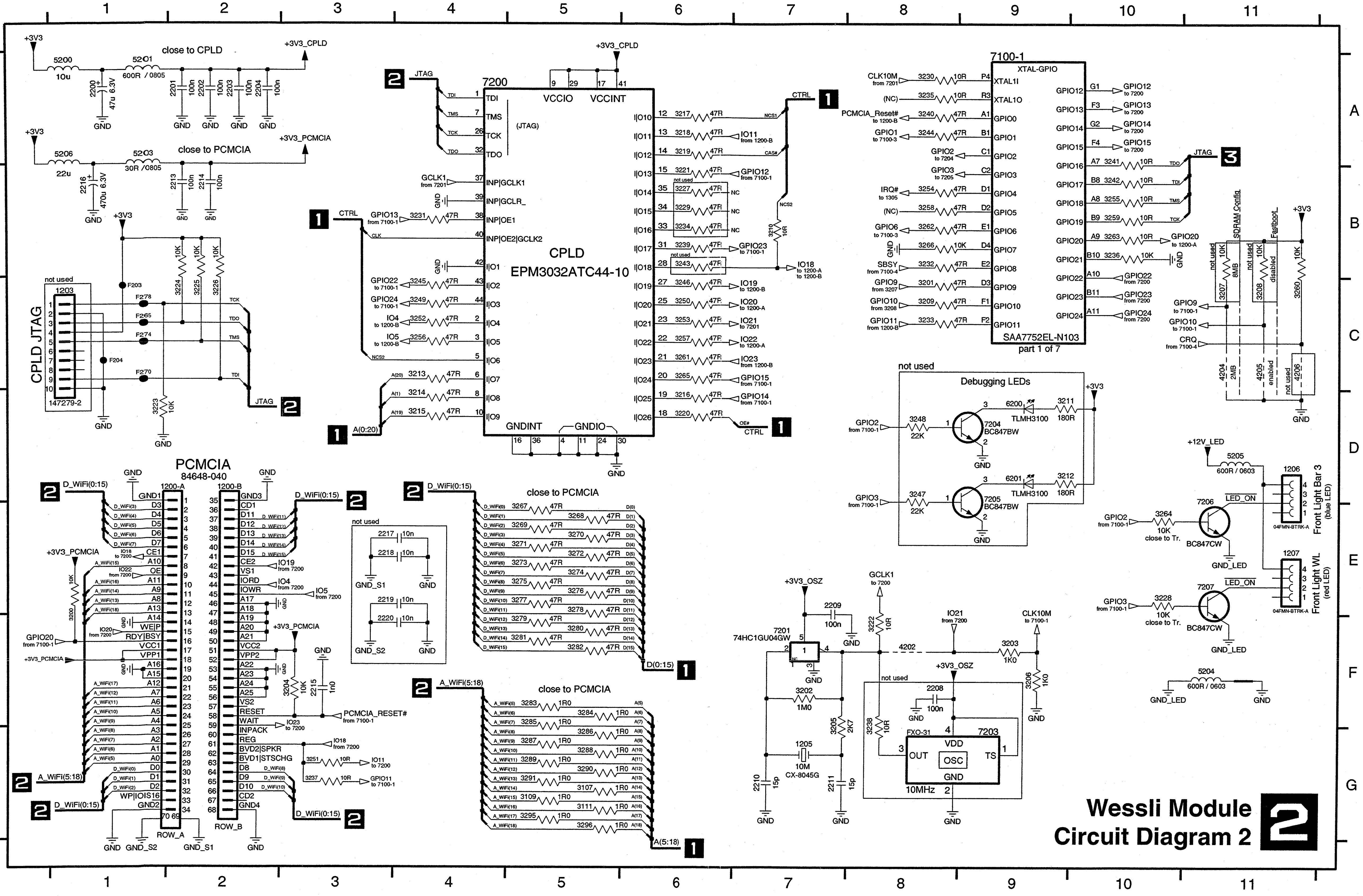

1
2
3
4
5
A
B
C
D
E
F
G
not used
1402
FRROM/TO MP3CD03
FMN
DAAB from 7100-4
WSAB from 7100-4
CLAB from 7100-4
SDA_MASTER from 7100-3
SCL_MASTER from 7100-3
CD03_RESET# from 7100-4
F424
F205
F208
F210
F211
F212
F213
F214
3437 10K
3438 10K
3439 10K
3436 10K
3428 10R
GND
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
7100-2
LCD-ADC
LCD-RW-WR
LCD-WE
LCD-CSB_
LCD-E-RD
LCD-RS
GPA0
GPA1
GPA2
GPA3
GPA4
LCD-DB0
LCD-DB1
LCD-DB2
LCD-DB3
LCD-DB4
LCD-DB5
LCD-DB6
LCD-DB7
F409 D14
F411 B17
F413 C14
F415 C16
F417 D13
F419 A17
F421 C13
F423 B16
A16 F408
K3 F410
C12 F412
B15 F414
D12 F416
N3 F418
M4
J3
B5
A5
+1V8_SAA
+3V3_SAA
SAA7752EL-N103
part 2 of 7
7100-7
NC
A12
A13
A14
A15
A2
A3
A4
A6
B12
B13
B14
B2
B3
B4
B6
B7
C11
C15
C17
C3
C4
D15
D16
D17
E14
E15
G17
H1
H17
J17
K17
K2
L17
M17
N15
N17
N4
P1
P14
P17
P2
P3
R14
R15
T14
T15
T16
T17
U14
U15
U16
U17
SAA7752EL-N103
part 7 of 7

1402	A5
3428	C4
3436	D4
3437	C4
3438	C4
3439	C4
7100-2	B1
7100-7	D1
F205	B5
F208	B5
F210	B5
F211	C5
F212	C5
F213	C5
F214	C5
F408	B2
F409	B1
F410	B2
F411	B1
F412	B2
F413	B1
F414	B2
F415	B1
F416	B2
F417	C1
F418	C2
F419	C1
F421	C1
F423	C1
F424	A5

1 Wessli Module Circuit Diagram 1


7104
M48LC4M16A2TG-75
8MByte (64Mbit)
9322 167 58668
DRAM
1M X 16 X 4
not used
+3V3_RAM
VDD
VDDQ
VSS
VSSQ
DQM
A(0:20)
CTRL
D_RAM(0:15)
GND
7101
K4S161622H-TC60
2MByte (16Mbit)
9322 205 81668
SYNC
DRAM
2x512Kx16
7100-4
CDB-EBI
SAA7752EL-N103
part 4 of 7
CDB-CFLAG-SBSY
CDB-CLAB
CDB-CRQ-NERDY
CDB-DAAB
CDB-EFAB
CDB-SFSY
CDB-V4-SUB
CDB-WSAB
CDB-RCK
CDB-NCRST-NHRDY
CD-CLOCK
(WE#) EBI-WEN
(CS#) EBI-SDNCS0
(CLK) EBI-SDCLKOUT
(OE#) EBI-NOE
(RAS#) EBI-NRAS
(CAS#) EBI-NCAS
(DQML) EBI-DQM0
(DQMH) EBI-DQM1
(CKE) EBI-CKE0
(CE#) EBI-NCS0
EBI-NCS1
EBI-NCS2
SBSY to 7100-1
CLAB to 1402
CRQ to 3289
DAAB to 1402
WSAB to 1402
CD03_RESET# to 1402
D(0:15)
close to SDRAM
close to Flash
close to Osz
+3V3
+3V3_ROM
+3V3_OSZ
+3V3_RAM
600R / 0805
600R / 0603
EMI 220R
7103
M29W160EB-70N6
2MByte (16MBit)
9322 197 26668
ROM
(2Mx8)
(1Mx16)
[FLASH]
0606
FIRMWARE
word mode (16bit)
RESET#
F124
3160 10K

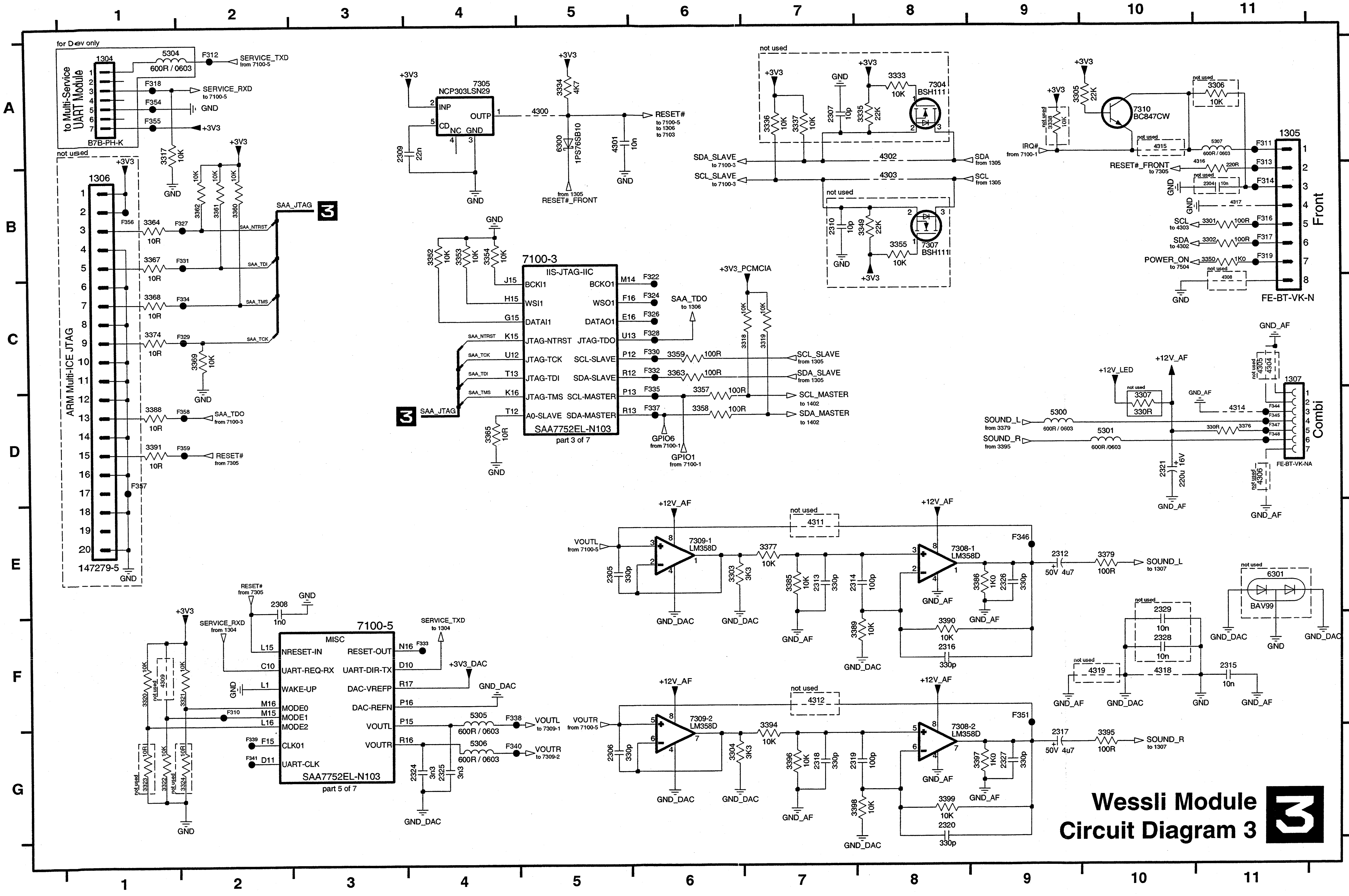
0606	B11
2100	B9
2101	B9
2102	B10
2103	B10
2104	B10
2105	B10
2106	B11
2107	B11
2108	A11
2110	E9
2111	B8
2112	B8
2113	B11
2114	B11
3106	B7
3108	B7
3110	B7
3112	B7
3114	B7
3115	C5
3116	C7
3117	C4
3118	C5
3119	C7
3120	C4
3121	C5
3122	C7
3123	C4
3124	C5
3125	C7
3126	C4
3127	C5
3128	C7
3129	C4
3130	C5
3131	C7
3132	C4
3133	D5
3134	D7
3136	D4
3137	D5
3138	D7
3139	D4
3140	D7
3141	D7
3142	D7
3143	D7
3144	D7
3145	D7
3146	D7
3147	D7
3148	D7
3149	E7
3150	E7
3151	E7
3152	E7
3153	E7
3154	E7
3155	E7
3156	E7
3157	E7
3158	E7
3159	E7
3160	E11
3161	A5
3162	A5
3163	B5
3164	B5
3165	B5
3166	B5
3167	B5
3168	B5
3169	E4
3170	E5
3171	E4
3172	E5
3173	E4
3174	E5
3175	E4
3176	E5
3177	F4
3178	F5
3179	F4
3180	F5
3181	F4
3182	F5
3183	F4
3184	F5
3185	A7
5100	A8
5101	A9
5102	A9
5103	A9
5104	B8
7100-4	A5
7101	E1
7103	C10
7104	B1
F100	A4
F101	A7
F102	A4
F104	B4
F105	B7
F106	B4
F107	A8
F109	B8
F111	B8
F113	B7
F114	B4
F115	B7
F116	C7
F117	C7
F118	C7
F119	C7
F120	C7
F122	C7
F123	D7
F124	E11
]



1 2 3 4 5 6 7 8 9 10 11
A B C D E F G
+3V3
5200 10u
5201 600R / 0805
close to CPLD
+3V3_CPLD
2200 47u 6.3V
2201 100n
2202 100n
2203 100n
2204 100n
GND
5206 22u
5203 30R / 0805
close to PCMCIA
+3V3_PCMCIA
2216 470u 6.3V
2213 100n
2214 100n
CPLD JTAG
not used
1203
147279-2
F203
F204
F278
F265
F274
F270
3224 10K
3225 10K
3226 10K
3223 10K
TCK
TDO
TMS
TDI
JTAG
7200
CPLD
EPM3032ATC44-10
VCCIO
VCCINT
(JTAG)
TDI
TMS
TCK
TDO
INP|GCLK1
INP|GCLR_
INP|OE1
INP|OE2|GCLK2
GNDINT
GNDIO
GCLK1 from 7201
CTRL
GPIO13 from 7100-1
CLK
NCS2
A(0:20)
I|O10
I|O11
I|O12
I|O13
I|O14
I|O15
I|O16
I|O17
I|O18
I|O19
I|O20
I|O21
I|O22
I|O23
I|O24
I|O25
I|O26
NCS1
CAS#
NC
OE#
IO11 from 1200-B
GPIO12 from 7100-1
GPIO23 from 7100-1
IO18 to 1200-A to 1200-B
IO19 to 1200-B
IO20 to 1200-A
IO21 to 7201
IO22 to 1200-A
IO23 to 1200-B
GPIO15 from 7100-1
GPIO14 from 7100-1
7100-1
XTAL-GPIO
SAA7752EL-N103
part 1 of 7
XTAL1I
XTAL1O
CLK10M from 7201
(NC)
PCMCIA_Reset# to 1200-B
IRQ# to 1305
SBSY from 7100-4
GPIO12 to 7200
GPIO13 to 7200
GPIO14 to 7200
GPIO15 to 7200
GPIO20 to 1200-A
GPIO22 from 7200
GPIO23 from 7200
GPIO24 from 7200
SDRAM Config
Fastboot
8MB
2MB
disabled
enabled
not used
GPIO9 to 7100-1
GPIO10 to 7100-1
CRQ from 7100-4
4204
4205
4206
3207
3208
3260
not used
Debugging LEDs
7204 BC847BW
7205 BC847BW
6200 TLMH3100
6201 TLMH3100
3211 180R
3212 180R
3248 22K
3247 22K
+12V_LED
5205 600R / 0603
1206
1207
04FMN-BTRK-A
Front Light Bar 3 (blue LED)
Front Light WL (red LED)
LED_ON
7206 BC847CW
7207 BC847CW
3264 10K close to Tr.
3228 10K close to Tr.
GND_LED
5204 600R / 0603
PCMCIA
84648-040
1200-A
1200-B
ROW_A
ROW_B
GND_S1
GND_S2
D_WiFi(0:15)
A_WiFi(5:18)
PCMCIA_RESET# from 7100-1
2217 10n
2218 10n
2219 10n
2220 10n
2215 1n0
3204 10K
3200 10K
close to PCMCIA
D(0:15)
A(5:18)
47R
1R0
+3V3_OSZ
7201
74HC1GU04GW
2209 100n
3202 1M0
3205 2K7
1205 10M CX-8045G
2210 15p
2211 15p
3222 10R
3238 10R
3203 1K0
3206 1K0
4202
IO21 from 7200
CLK10M to 7100-1
GCLK1 to 7200
2208 100n
7203
FXO-31
VDD
OSC
OUT
TS
GND
10MHz

Wessli Module
Circuit Diagram 2

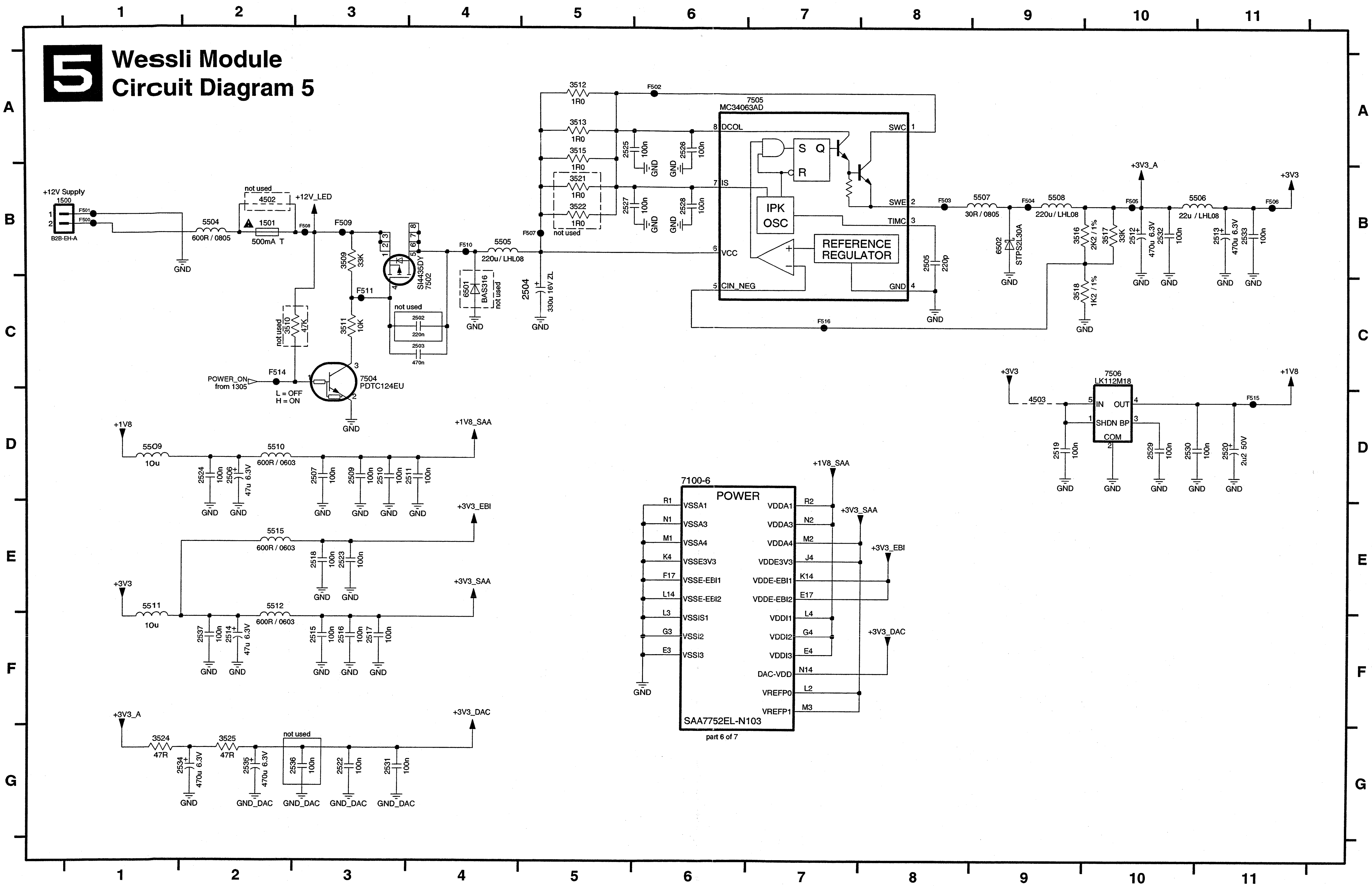
1200-A	D2
1200-B	D2
1203	C1
1205	G7
1206	D11
1207	E11
2200	A1
2201	A2
2202	A2
2203	A2
2204	A2
2208	F8
2209	E7
2210	G7
2211	G7
2213	B2
2214	B2
2215	F3
2216	B1
2217	E3
2218	E3
2219	E3
2220	F3
3107	G5
3109	G5
3111	G5
3200	F1
3201	C8
3202	F7
3203	F9
3204	F3
3205	F7
3206	F9
3207	C11
3208	C11
3209	C8
3210	B7
3211	D9
3212	D9
3213	C4
3214	D4
3215	D4
3216	D6
3217	A6
3218	A6
3219	A6
3220	D6
3221	B6
3222	F8
3223	D1
3224	C2
3225	C2
3226	C2
3227	B6
3228	E10
3229	B6
3230	A8
3231	B4
3232	B8
3233	C8
3234	B6
3235	A8
3236	B10
3237	G3
3238	F8
3239	B6
3240	A8
3241	A10
3242	B10
3243	B6
3244	A8
3245	C4
3246	C6
3247	D8
3248	D8
3249	C4
3250	C6
3251	G3
3252	C4
3253	C6
3254	B8
3255	B10
3256	C4
3257	C6
3258	B8
3259	B10
3260	C11
3261	C6
3262	B8
3263	B10
3264	E10
3265	C6
3266	B8
3267	E5
3268	E5
3269	E5
3270	E5
3271	E5
3272	E5
3273	E5
3274	E5
3275	E5
3276	E5
3277	E5
3278	E5
3279	F5
3280	F5
3281	F5
3282	F5
3283	F5
3284	F5
3285	F5
3286	G5
3287	G5
3288	G5
3289	G5
3290	G5
3291	G5
3295	G5
3296	G5
4202	F8
4204	C11
4205	C11
4206	C11
5200	A1
5201	A1
5203	A1
5204	F11
5205	D11
5206	A1
6200	D9
6201	D9
7100-1	A9
7200	A4
7201	F7
7203	G9
7204	D9
7205	D9
7206	E11
7207	E11
F203	C1
F204	C1
F265	C1
F270	C1
F274	C1
F278	C1


1 2 3 4 5 6 7 8 9 10 11
A B C D E F G
for Dev only
1304
to Multi-Service UART Module
B7B-PH-K
5304 600R / 0603
F312 SERVICE_TXD from 7100-5
F318 SERVICE_RXD to 7100-5
F354 GND
F355 +3V3
3317 10K
GND
not used
1306
ARM Multi-ICE JTAG
147279-5
F356 3364 10R F327
3367 10R F331
3368 10R F334
3374 10R F329
3369 10K
3388 10R F358 SAA_TDO to 7100-3
3391 10R F359 RESET# from 7305
F357
3362 10K 3361 10K 3360 10K
SAA_JTAG
SAA_NTRST SAA_TDI SAA_TMS SAA_TCK
+3V3
7305 NCP303LSN29
INP OUTP CD NC GND
2309 22n
3334 4K7
4300
RESET# to 7100-5 to 1306 to 7103
6300 1PS76SB10
from 1305 RESET#_FRONT
4301 10n
7100-3 IIS-JTAG-IIC
BCKI1 WSI1 DATAI1 JTAG-NTRST JTAG-TCK JTAG-TDI JTAG-TMS A0-SLAVE
BCKO1 WSO1 DATAO1 JTAG-TDO SCL-SLAVE SDA-SLAVE SCL-MASTER SDA-MASTER
SAA7752EL-N103 part 3 of 7
3352 10K 3353 10K 3354 10K
3365 10R
F322 F324 F326 F328 F330 F332 F335 F337
SAA_TDO to 1306
+3V3_PCMCIA
3318 10K 3319 10K
3359 100R SCL_SLAVE from 1305
3363 100R SDA_SLAVE from 1305
3357 100R SCL_MASTER to 1402
3358 100R SDA_MASTER to 1402
GPIO6 from 7100-1
GPIO1 from 7100-1
not used
3336 10K 3337 10K
2307 10p 3335 22K 3333 10K
7304 BSH111
SDA_SLAVE to 7100-3 4302 SDA from 1305
SCL_SLAVE to 7100-3 4303 SCL from 1305
2310 10p 3349 22K 3355 10K
7307 BSH111
3305 22K
7310 BC847CW
3338 10K
IRQ# from 7100-1
4315
3306 10K
5307 600R / 0603
F311 F313 F314 F316 F317 F319
RESET#_FRONT to 7305
4316 220R
2304 10n
4317
SCL to 4303 3301 100R
SDA to 4302 3302 100R
POWER_ON to 7504 3350 1K0
4308
1305 Front FE-BT-VK-N
GND_AF
4305 4304
1307 Combi FE-BT-VK-NA
+12V_LED 3307 330R
+12V_AF
4314
F344 F345 F347 F348
SOUND_L from 3379 5300 600R / 0603
SOUND_R from 3395 5301 600R / 0603
330R 3376
2321 220u 16V
4306
VOUTL from 7100-5
7309-1 LM358D
2305 330p 3303 3K3
3377 10K
3385 10K 2313 330p 2314 100p 3389 10K
GND_DAC
4311
7308-1 LM358D
F346
3386 1K0 2326 330p
3390 10K 2316 330p
2312 50V 4u7 3379 100R SOUND_L to 1307
6301 BAV99
2329 10n 2328 10n
4319 4318 2315 10n
VOUTR from 7100-5
7309-2 LM358D
2306 330p 3304 3K3
3394 10K
3396 10K 2318 330p 2319 100p 3398 10K
4312
7308-2 LM358D
F351
3397 1K0 2327 330p
3399 10K 2320 330p
2317 50V 4u7 3395 100R SOUND_R to 1307
RESET# from 7305
2308 1n0
SERVICE_RXD from 1304
SERVICE_TXD to 1304
7100-5 MISC
NRESET-IN UART-REQ-RX WAKE-UP MODE0 MODE1 MODE2 CLK01 UART-CLK
RESET-OUT UART-DIR-TX DAC-VREFP DAC-REFN VOUTL VOUTR
SAA7752EL-N103 part 5 of 7
+3V3_DAC
F310 F333 F338 F339 F340 F341
5305 600R / 0603 VOUTL to 7309-1
5306 600R / 0603 VOUTR to 7309-2
2324 3n3 2325 3n3
3320 10K 4309 3321 10K
3323 10K 3322 10K 3324 10K

Wessli Module
Circuit Diagram 3

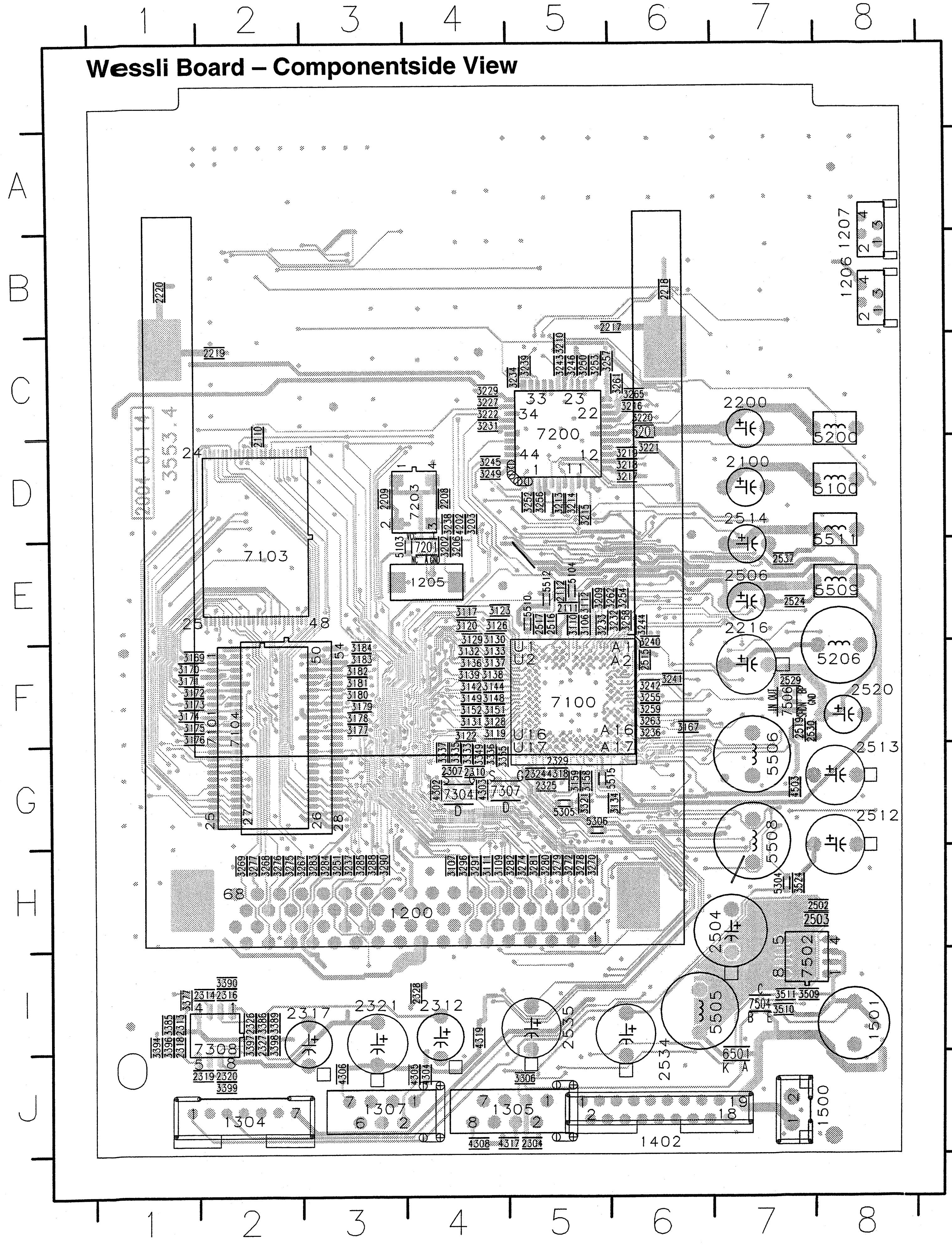
1304	A1
1305	A11
1306	B1
1307	C11
2304	B11
2305	E5
2306	G5
2307	A7
2308	E2
2309	A3
2310	B7
2312	E9
2313	E7
2314	E7
2315	F11
2316	F8
2317	G9
2318	G7
2319	G7
2320	G8
2321	D10
2324	G4
2325	G4
2326	E9
2327	G9
2328	F10
2329	F10
3301	B11
3302	B11
3303	E6
3304	G6
3305	A9
3306	A11
3307	D10
3317	A1
3318	C7
3319	C7
3320	F1
3321	F2
3322	G1
3323	G1
3324	G2
3333	A8
3334	A5
3335	A8
3336	A7
3337	A7
3338	A9
3349	B8
3350	B11
3352	B4
3353	B4
3354	B4
3355	B8
3357	C6
3358	D6
3359	C6
3360	B2
3361	B2
3362	B2
3363	C6
3364	B1
3365	D4
3367	B1
3368	C1
3369	C2
3374	C1
3376	D11
3377	E7
3379	E10
3385	E7
3386	E9
3388	D1
3389	F7
3390	F8
3391	D1
3394	G7
3395	G10
3396	G7
3397	G9
3398	G7
3399	G8
4300	A5
4301	A5
4302	A8
4303	B8
4304	C11
4305	C11
4306	D11
4308	C11
4309	F1
4311	E7
4312	F7
4314	D11
4315	A10
4316	B11
4317	B11
4318	F10
4319	F10
5300	D9
5301	D10
5304	A1
5305	F4
5306	G4
5307	A11
6300	A5
6301	E11
7100-3	B5
7100-5	F3
7304	A8
7305	A4
7307	B8
7308-1	E8
7308-2	G8
7309-1	E6
7309-2	F6
7310	A10
F310	F2
F311	A11
F312	A2
F313	B11
F314	B11
F316	B11
F317	B11
F318	A1
F319	B11
F322	C6
F324	C6
F326	C6
F327	B2
F328	C6
F329	C2
F330	C6
F331	B2
F332	C6
F333	F4
F334	C2
F335	D6
F337	D6
F338	F4
F339	G2
F340	G4
F341	G2
F344	D11
F345	D11
F346	E9
F347	D11
F348	D11
F351	F9
F354	A1
F355	A1
F356	B1
F357	D1
F358	D2
F359	D2

5 Wessli Module Circuit Diagram 5


1 2 3 4 5 6 7 8 9 10 11
A B C D E F G
+12V Supply
1500
B2B-EH-A
F501
F500
5504
600R / 0805
GND
not used
4502
+12V_LED
1501
500mA T
F508
F509
3509
33K
F511
3510
47K
not used
3511
10K
F514
POWER_ON
from 1305
L = OFF
H = ON
7504
PDTC124EU
GND
SI4435DY
7502
not used
2502
220n
2503
470n
F510
5505
220u/ LHL08
6501
BAS316
not used
GND
2504
330u 16V ZL
F507
3512
1R0
3513
1R0
3515
1R0
3521
1R0
3522
1R0
not used
F502
2525
100n
2526
100n
2527
100n
2528
100n
GND
7505
MC34063AD
DCOL
SWC
IS
S
Q
R
IPK
OSC
SWE
TIMC
VCC
REFERENCE
REGULATOR
CIN_NEG
GND
2505
220p
F516
F503
5507
30R / 0805
6502
STPS2L30A
F504
5508
220u / LHL08
3516
2K2 / 1%
3517
33K
3518
1K2 / 1%
+3V3_A
F505
2512
470u 6.3V
2532
100n
5506
22u / LHL08
2513
470u 6.3V
2533
100n
F506
+3V3
+3V3
4503
7506
LK112M18
IN
OUT
SHDN BP
COM
F515
+1V8
2519
100n
2529
100n
2530
100n
2520
2u2 50V
+1V8
5509
10u
5510
600R / 0603
+1V8_SAA
2524
100n
2506
47u 6.3V
2507
100n
2509
100n
2510
100n
2511
100n
5515
600R / 0603
+3V3_EBI
2518
100n
2523
100n
+3V3
5511
10u
5512
600R / 0603
+3V3_SAA
2537
100n
2514
47u 6.3V
2515
100n
2516
100n
2517
100n
+3V3_A
3524
47R
3525
47R
not used
+3V3_DAC
2534
470u 6.3V
2535
470u 6.3V
2536
100n
2522
100n
2531
100n
GND_DAC
7100-6
POWER
R1 VSSA1
N1 VSSA3
M1 VSSA4
K4 VSSE3V3
F17 VSSE-EBI1
L14 VSSE-EBI2
L3 VSSIS1
G3 VSSI2
E3 VSSI3
VDDA1 R2
VDDA3 N2
VDDA4 M2
VDDE3V3 J4
VDDE-EBI1 K14
VDDE-EBI2 E17
VDDI1 L4
VDDI2 G4
VDDI3 E4
DAC-VDD N14
VREFP0 L2
VREFP1 M3
+1V8_SAA
+3V3_SAA
+3V3_EBI
+3V3_DAC
SAA7752EL-N103
part 6 of 7

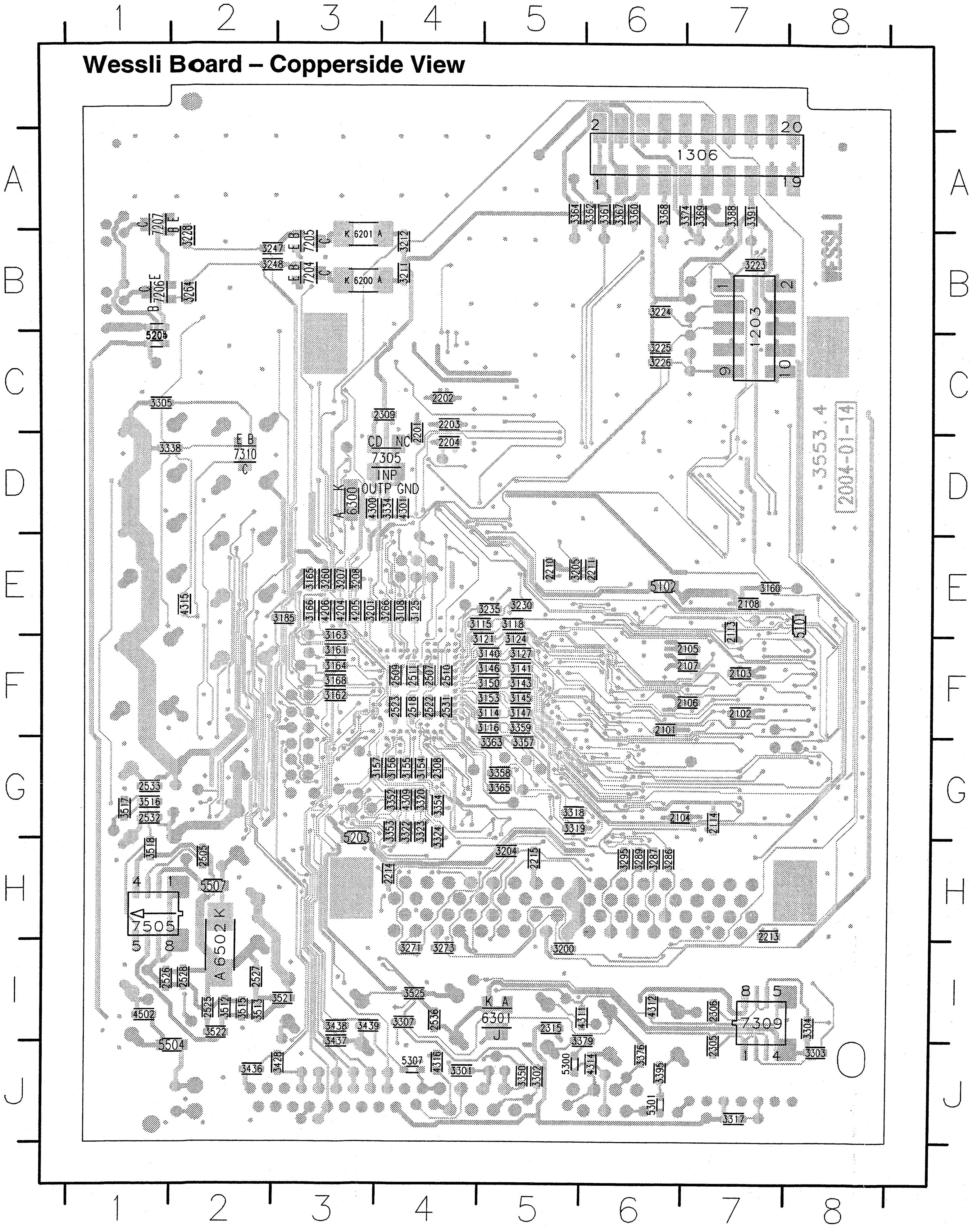
1500	B1
1501	B2
2502	C4
2503	C4
2504	C5
2505	B8
2506	D2
2507	D3
2509	D3
2510	D3
2511	D4
2512	B10
2513	B11
2514	F2
2515	F3
2516	F3
2517	F3
2518	E3
2519	D9
2520	D11
2522	G3
2523	E3
2524	D2
2525	A5
2526	A6
2527	B5
2528	B6
2529	D10
2530	D10
2531	G3
2532	B10
2533	B11
2534	G2
2535	G2
2536	G3
2537	F2
3509	B3
3510	C2
3511	C3
3512	A5
3513	A5
3515	A5
3516	B9
3517	B10
3518	C9
3521	B5
3522	B5
3524	G1
3525	G2
4502	B2
4503	D9
5504	B2
5505	B4
5506	B10
5507	B9
5508	B9
5509	D1
5510	D2
5511	E1
5512	E2
5515	E2
6501	C4
6502	B9
7100-6	D6
7502	C4
7504	C3
7505	A7
7506	C10
F500	B1
F501	B1
F502	A6
F503	B8
F504	B9
F505	B10
F506	B11
F507	B5
F508	B3
F509	B3
F510	B4
F511	C3
F514	C2
F515	D11
F516	C7

Wessli Board – Componentside View


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
J
1207
1206
2220
2218
2219
2217
2110
7103
7203
1205
7200
2200
5200
2100
5100
2514
5511
2506
5509
2216
5206
2520
7100
2513
5506
7101
7104
7304
7307
2512
5508
1200
2504
7502
2502
2503
5505
7504
6501
1501
7308
2317
2321
2312
2535
2534
1304
1307
1305
1402
1500
3553.4

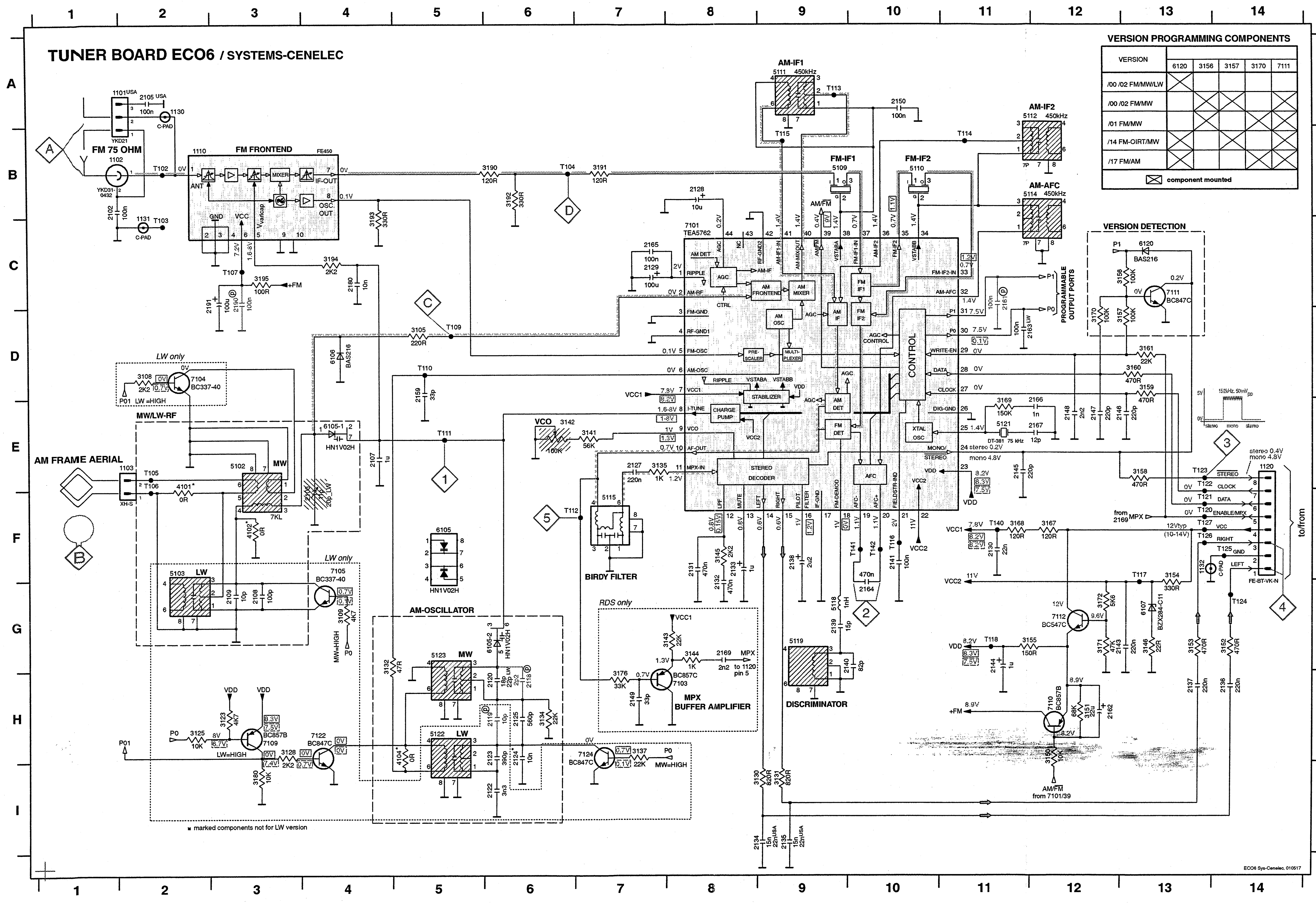
1200	H4	3136	F4	3268	H2	7203	D4
1205	E4	3137	F4	3269	H2	7304	G4
1206	B8	3138	F4	3270	H5	7307	G4
1207	A8	3139	F4	3272	H5	7308	I2
1304	J2	3142	F4	3274	H5	7502	I7
1305	J5	3144	F4	3275	H2	7504	I7
1307	J3	3148	F4	3276	H2	7506	F7
1402	J6	3149	F4	3277	H2		
1500	J8	3151	F4	3278	H5		
1501	I8	3152	F4	3279	H5		
2100	D7	3158	G5	3280	H5		
2110	C2	3159	G5	3281	H5		
2111	E5	3167	F6	3282	H4		
2112	E5	3169	F1	3283	H3		
2200	C7	3170	F1	3284	H3		
2208	D4	3171	F1	3285	H3		
2209	D3	3172	F1	3288	H3		
2216	E7	3173	F1	3290	H3		
2217	B6	3174	F1	3291	H4		
2218	B6	3175	F1	3296	H4		
2219	C2	3176	F1	3306	J5		
2220	B1	3177	F3	3321	G5		
2304	J5	3178	F3	3333	G4		
2307	G4	3179	F3	3335	G4		
2310	G4	3180	F3	3336	G4		
2312	I4	3181	F3	3337	G4		
2313	I1	3182	F3	3349	G4		
2314	I2	3183	F3	3355	G4		
2316	I2	3184	F3	3377	I1		
2317	I3	3202	E4	3385	I1		
2318	I1	3203	D4	3386	I2		
2319	J2	3206	E4	3389	I2		
2320	J2	3209	E5	3390	I2		
2321	I3	3210	C5	3394	I1		
2324	G5	3213	D5	3396	I1		
2325	G5	3214	D5	3397	I2		
2326	I2	3215	D5	3398	I2		
2327	I2	3216	C6	3399	J2		
2328	I4	3217	D6	3509	I7		
2329	G5	3218	D6	3510	I7		
2502	H8	3219	D6	3511	I7		
2503	H7	3220	C6	3524	H7		
2504	H6	3221	D6	4202	D4		
2506	E7	3222	C4	4302	G4		
2512	G8	3227	C4	4303	G4		
2513	G8	3229	C4	4304	J4		
2514	D7	3231	C4	4305	J4		
2515	F6	3232	E6	4306	J3		
2516	E5	3233	E5	4308	J4		
2517	E5	3234	C5	4317	J4		
2519	F7	3236	F6	4318	G5		
2520	F8	3237	H3	4319	I4		
2524	E7	3238	D4	4503	G7		
2529	F7	3239	C5	5100	D8		
2530	F7	3240	F6	5103	E3		
2534	J6	3241	F6	5104	E5		
2535	I5	3242	F6	5200	D8		
2537	E7	3243	C5	5201	C6		
3106	E5	3244	E6	5206	F8		
3107	H4	3245	D4	5304	H7		
3109	H4	3246	C5	5305	G5		
3110	E5	3249	D4	5306	G5		
3111	H4	3250	C5	5505	I7		
3112	E5	3251	H3	5506	G7		
3117	E4	3252	D5	5508	G7		
3119	F4	3253	C5	5509	E8		
3120	E4	3254	E6	5510	E5		
3122	F4	3255	F6	5511	E8		
3123	E4	3256	D5	5512	E5		
3126	E4	3257	C5	5515	G5		
3128	F4	3258	E6	6501	J7		
3129	E4	3259	F6	7100	F5		
3130	E4	3261	C6	7101	F2		
3131	F4	3262	E5	7103	E2		
3132	F4	3263	F6	7104	F2		
3133	F4	3265	C6	7200	C5		
3134	G6	3267	H2	7201	E4		

Wessli Board – Copperside View



1203	B7	3208	E3	4309	G4
1306	A7	3211	B4	4311	I6
2101	F6	3212	B4	4312	I6
2102	F7	3223	B7	4314	J6
2103	F7	3224	B6	4315	E2
2104	G6	3225	C6	4316	J4
2105	F7	3226	C6	4502	I1
2106	F7	3228	B2	5101	E8
2107	F7	3230	E5	5102	E6
2108	E7	3235	E5	5203	H3
2113	E7	3247	B2	5204	C1
2114	G7	3248	B2	5205	C1
2201	D4	3260	E3	5300	J5
2202	C4	3264	B2	5301	J6
2203	C4	3266	E4	5307	J4
2204	D4	3271	I4	5504	J2
2210	E5	3273	I4	5507	H2
2211	E6	3286	H6	6200	B3
2213	H7	3287	H6	6201	B3
2214	H4	3289	H6	6300	D3
2215	H5	3295	H6	6301	I5
2305	J7	3301	J4	6502	I2
2306	I7	3302	J5	7204	B3
2308	G4	3303	J8	7205	B3
2309	C4	3304	I8	7206	B1
2315	I5	3305	C1	7207	A1
2505	H2	3307	I4	7305	D4
2507	F4	3317	J7	7309	I7
2509	F4	3318	G5	7310	D2
2510	F4	3319	G5	7505	H1
2511	F4	3320	G4		
2518	F4	3322	G4		
2522	F4	3323	G4		
2523	F4	3324	G4		
2525	I2	3334	D4		
2526	I1	3338	D1		
2527	I2	3350	J5		
2528	I2	3352	G4		
2531	F4	3353	G4		
2532	G1	3354	G4		
2533	G1	3357	G5		
2536	I4	3358	G5		
3108	E4	3359	F5		
3114	F5	3360	A6		
3115	E4	3361	A6		
3116	F5	3362	A6		
3118	E5	3363	G5		
3121	F5	3364	A5		
3124	F5	3365	G5		
3125	E4	3367	A6		
3127	F5	3368	A6		
3140	F5	3369	A7		
3141	F5	3374	A6		
3143	F5	3376	J6		
3145	F5	3379	I6		
3146	F5	3388	A7		
3147	F5	3391	A7		
3150	F5	3395	J6		
3153	F5	3428	J3		
3154	G4	3436	J2		
3155	G4	3437	J3		
3156	G4	3438	I3		
3157	G3	3439	I3		
3160	E7	3512	I2		
3161	F3	3513	I2		
3162	F3	3515	I2		
3163	F3	3516	G1		
3164	F3	3517	G1		
3165	E3	3518	H1		
3166	E3	3521	I3		
3168	F3	3522	I2		
3185	E3	3525	I4		
3200	I5	4204	E3		
3201	E3	4205	E3		
3204	H5	4206	E3		
3205	E5	4300	D3		
3207	E3	4301	D4		

TUNER BOARD ECO6 / SYSTEMS-CENELEC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A B C D E F G H I
FM 75 OHM
YKD21
YKD31-0432
C-PAD
FM FRONTEND
FE450
ANT
MIXER
IF-OUT
OSC. OUT
GND
VCC
Vvaricap
AM FRAME AERIAL
XH-S
MW/LW-RF
LW only
BC337-40
P01 LW =HIGH
HN1V02H
MW
7KL
LW
MW=HIGH
AM-OSCILLATOR
BC857B
BC847C
LW=HIGH
P0
P01
MW=HIGH
VCO
BIRDY FILTER
RDS only
MPX BUFFER AMPLIFIER
BC857C
to 1120 pin 5
AM-IF1
5111 450kHz
AM-IF2
5112 450kHz
AM-AFC
5114 450kHz
FM-IF1
5109
FM-IF2
5110
AM/FM
7101 TEA5762
AM DET
RIPPLE
AM-RF
FM-GND
RF-GND1
FM-OSC
AM-OSC
VCC1
I-TUNE
VCO
AF-OUT
MPX-IN
AGC
AM FRONTEND
AM MIXER
AM OSC
AM IF
FM IF1
FM IF2
AGC CONTROL
CONTROL
PRE-SCALER
MULTI-PLEXER
STABILIZER
CHARGE PUMP
AM DET
FM DET
STEREO DECODER
XTAL OSC
AFC
FM-IF2-IN
AM-AFC
WRITE-EN
DATA
CLOCK
DIG-GND
MONO/STEREO
VDD
VCC2
LPF
MUTE
LEFT
RIGHT
PILOT
FILTER
IF-GND
FM-DEMOD
AFC-
AFC+
FIELDSTR-IND
DT-381 75 kHz
PROGRAMMABLE OUTPUT PORTS
DISCRIMINATOR
VERSION DETECTION
BAS216
BC847C
BC547C
BZX284-C11
AM/FM from 7101/39
from 2169 MPX
12Vtyp (10-14V)
STEREO
CLOCK
DATA
ENABLE/MPX
VCC
RIGHT
GND
LEFT
FE-BT-VK-N
to/from
stereo 0.4V
mono 4.8V
stereo mono stereo
5V
A B C D
1 2 3 4 5

VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	☒				
/00 /02 FM/MW		☒	☒		☒
/01 FM/MW		☒		☒	☒
/14 FM-OIRT/MW	☒		☒		☒
/17 FM/AM	☒			☒	☒

☒ component mounted

∗ marked components not for LW version

ECO6 Sys-Cenelec, 010517

1101	A2
1102	B1
1103	E2
1110	B2
1120	E14
1130	A2
1131	C2
1132	F13
2102	B1
2105	A2
2106	E3
2107	E4
2108	G3
2109	G3
2118	H6
2119	H6
2120	H6
2122	I6
2123	H6
2124	H6
2125	H6
2127	E7
2128	B8
2129	C7
2130	F11
2131	F8
2132	F8
2133	F8
2134	I8
2135	I9
2136	H14
2137	H13
2138	F9
2139	G9
2140	G9
2141	F10
2143	G12
2144	G11
2145	E11
2146	E12
2147	E12
2148	E12
2149	H7
2150	A10
2159	D5
2161	C11
2162	H12
2163	D11
2164	G10
2165	C7
2166	E11
2167	E11
2169	G8
2180	C4
2190	C3
2191	C3
3105	D5
3108	D2
3109	G4
3123	H3
3125	H2
3128	H3
3130	I9
3131	I9
3132	G4
3134	H6
3135	E7
3137	H7
3141	E7
3142	E6
3143	G7
3144	G8
3145	F8
3146	G13
3150	H12
3151	H12
3152	G14
3153	G13
3154	F13
3155	G12
3156	C12
3157	D12
3158	E13
3159	D13
3160	D13
3161	D13
3167	F12
3168	F11
3169	E11
3170	D12
3171	G12
3172	G12
3176	H7
3180	I3
3190	B6
3191	B7
3192	B6
3193	B4
3194	C4
3195	C3
4101	E2
4102	F3
4104	H5
5102	E3
5103	F2
5109	B9
5110	B10
5111	A9
5112	A11
5114	B11
5115	E7
5118	G9
5119	G9
5121	E11
5122	H5
5123	G5
6105-1	E4
6105-2	G6
6106	D4
6107	G13
6120	C13
7101	C8
7103	H8
7104	D2
7105	F4
7109	H3
7110	H12
7111	C13
7112	G12
7122	H4
7124	H7
T102	B2
T103	B2
T104	B6
T105	E2
T106	E2
T107	C3
T109	D5
T110	D5
T111	E5
T112	F7
T113	A9
T114	B11
T116	F10
T117	F13
T118	G11
T120	F13
T121	F13
T122	E13
T123	E13
T124	G14
T125	F14
T126	F13
T127	F13
T140	F11
T141	F10
T142	F10

LEGEND

* ... only assembled in FM/AM-version
ⓟ...for provision only
USA ... for USA version only
LW ... for LW version only

SMD jumper
41xx
0R

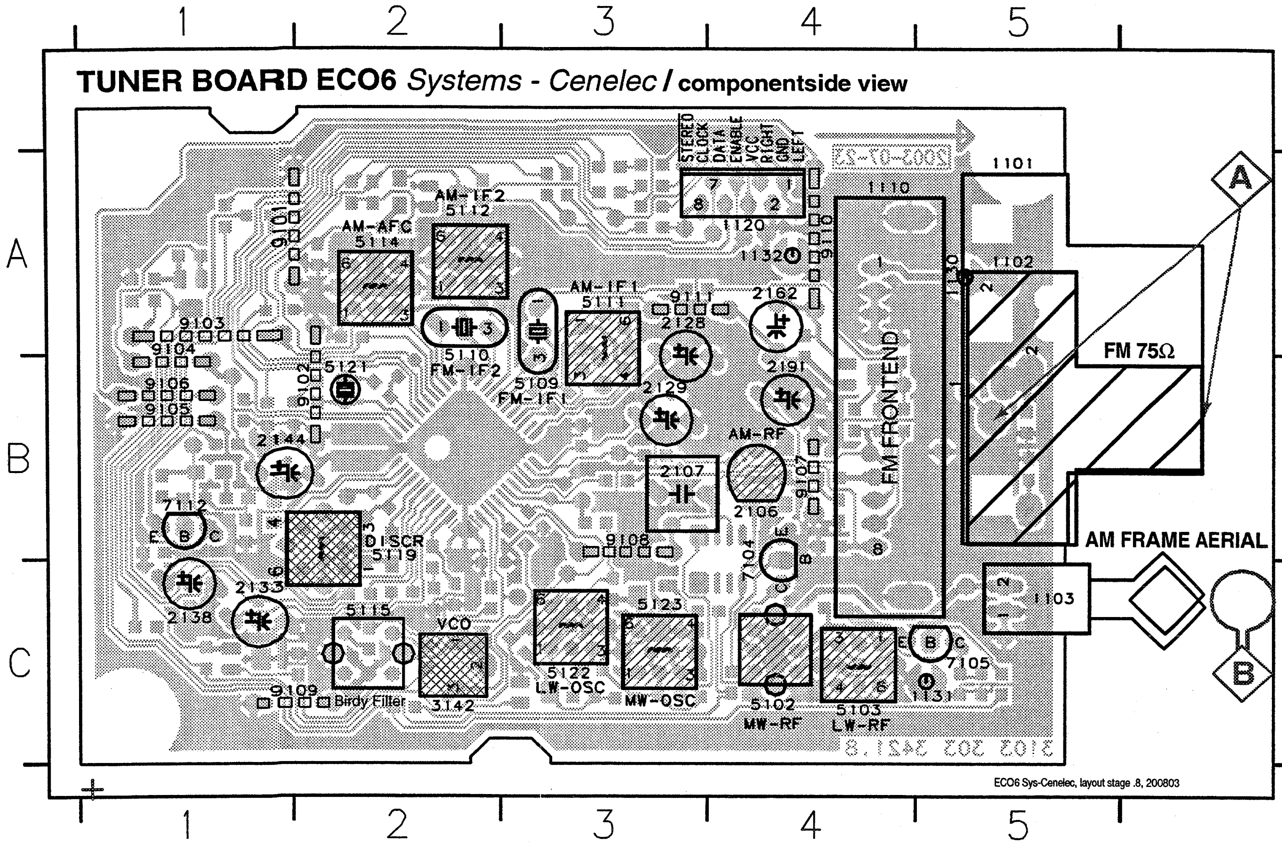
Ⓥ EVM

...V	FM mode stereo
...V (boxed)	MW mode
...V (dashed box)	LW mode

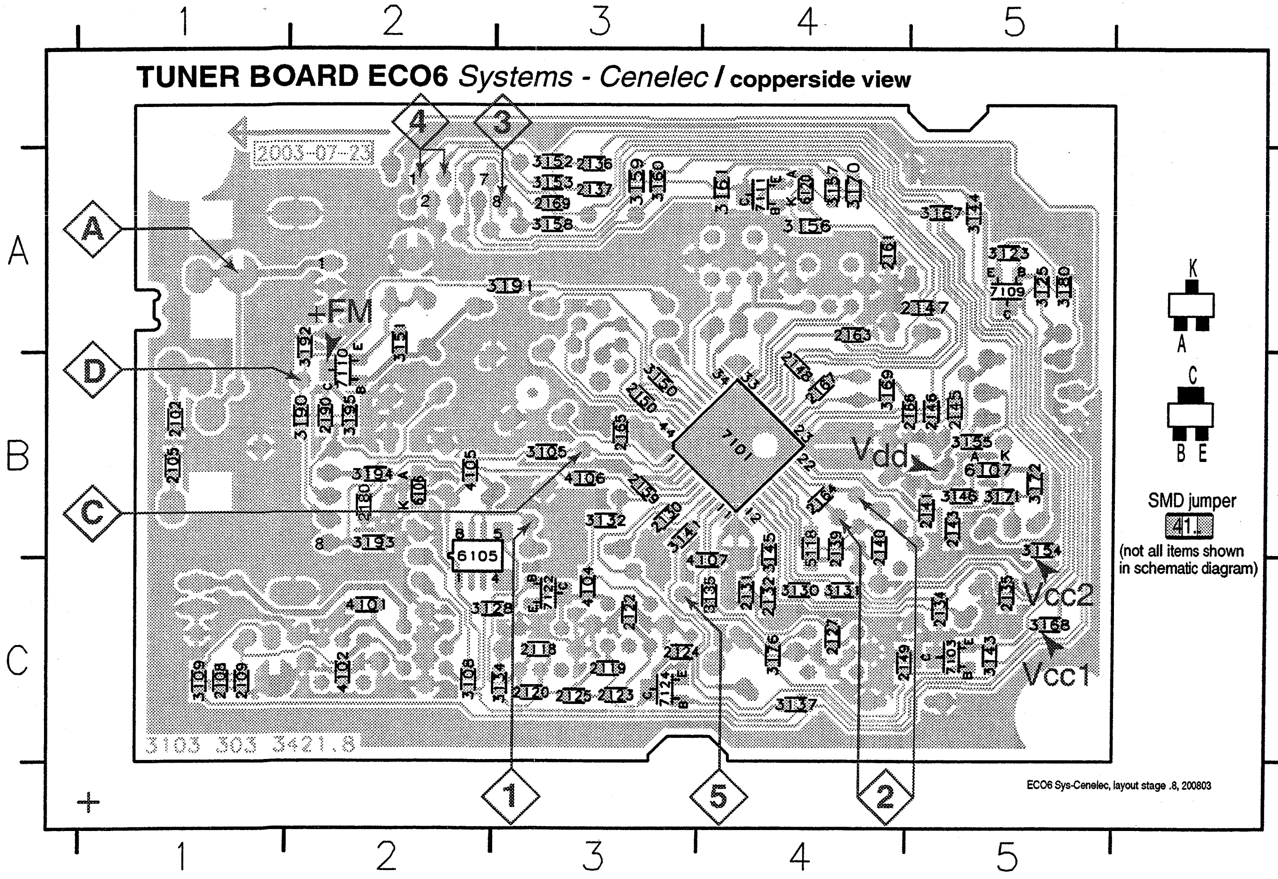
voltages measured while
set is tuned to a strong transmitter

Signal path
- FM
- AM
- MPX (Audio Frequency)
- ⇨ AF - left/right

1101	B5	1110	B4	1131	C5	2107	B3	2133	C1	2162	A4	5102	C4	5110	A2	5114	A2	5121	B2	7104	C4	9101	A2	9104	B1	9107	B4	9110	A4
1102	B5	1120	A4	1132	A4	2128	A3	2138	B1	2191	B4	5103	C4	5111	A3	5115	C2	5122	C3	7105	C5	9102	B2	9105	B1	9108	B3	9111	A3
1103	C5	1130	A5	2106	B4	2129	B3	2144	B1	3142	C2	5109	B3	5112	A2	5119	B2	5123	C3	7112	B1	9103	A1	9106	B1	9109	C2		

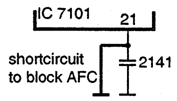
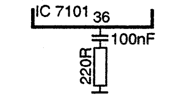
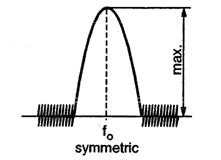
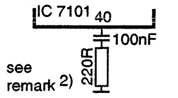
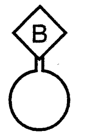
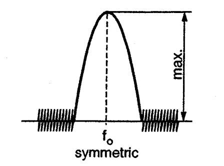

1
2
3
4
5
A
B
C
TUNER BOARD ECO6 Systems - Cenelec / componentside view
STEREO
CLOCK
DATA
ENABLE
VCC
RIGHT
GND
LEFT
2003-07-23
1101
1110
1120
1132
9110
9111
1102
1130
AM-IF2
5112
AM-AFC
5114
9101
9102
9103
9104
9105
9106
5121
5110
FM-IF2
5109
FM-IF1
AM-IF1
5111
2128
2129
2162
2191
AM-RF
2107
2106
2144
7112
DISCR
5119
2133
2138
9108
7104
FM FRONTEND
FM 75Ω
AM FRAME AERIAL
A
B
1103
5115
VCO
5122
LW-OSC
5123
MW-OSC
5102
MW-RF
5103
LW-RF
7105
1131
9109
Birdy Filter
3142
3103 303 3421.8
ECO6 Sys-Cenelec, layout stage .8, 200803

2102	B1	2120	C3	2130	B3	2137	A3	2146	B5	2161	A4	2169	A3	3123	A5	3134	C3	3145	C4	3154	B5	3160	A3	3171	B5	3192	A2	4104	C3	6106	B2	7110	B2
2105	B1	2122	C3	2131	C4	2139	B4	2147	A5	2163	A4	2180	B2	3125	A5	3135	C4	3146	B5	3155	B5	3161	A4	3172	B5	3193	B2	4105	B2	6107	B5	7111	A4
2108	C1	2123	C3	2132	C4	2140	B4	2148	B4	2164	B4	2190	B2	3128	C2	3137	C4	3150	B3	3156	A4	3167	A5	3176	C4	3194	B2	4106	B3	6120	A4	7122	C3
2109	C1	2124	C3	2134	C5	2141	B5	2149	C4	2165	B3	3105	B3	3130	C4	3141	B3	3151	A2	3157	A4	3168	C5	3180	A5	3195	B2	4107	C4	7101	B4	7124	C3
2118	C3	2125	C3	2135	C5	2143	B5	2150	B3	2166	B5	3108	C2	3131	C4	3143	C5	3152	A3	3158	A3	3169	B4	3190	B2	4101	C2	5118	C4	7103	C5		
2119	C3	2127	C4	2136	A3	2145	B5	2159	B3	2167	B4	3109	C1	3132	B3	3144	A5	3153	A3	3159	A3	3170	A4	3191	A3	4102	C2	6105	B2	7109	A5		


1
2
3
4
5
A
B
C
TUNER BOARD ECO6 Systems - Cenelec / copperside view
2003-07-23
4
3
A
D
C
+FM
Vdd
Vcc2
Vcc1
7101
6105
3191
3105
3193
3194
4101
4106
4107
K
A
C
B E
SMD jumper
41
(not all items shown in schematic diagram)
1
5
2
3103 303 3421.8
ECO6 Sys-Cenelec, layout stage .8, 200803

These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (**ECO6 Cenelec** FM/MW - and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	◇1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
FM	10.7MHz, 45mV continuous wave	◇D	 IC 7101 21 shortcircuit to block AFC 2141	5119	◇2	0mV ±3mV
FM - VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz 1)
FM RF (channel separation) Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.						
FM	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	◇A	98MHz	IF coil inside FM frontend 1110	◇4	right channel min.
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇C $\Delta f = \pm 10$kHz $V_{RF} = 0.5$mV (as low as possible)	 IC 7101 36 100nF 220R	5111	◇5	 max. f_o symmetric
			 IC 7101 40 100nF 220R see remark 2)	5112		
AM AFC **MW**		◇C continuous wave $V_{RF} = 2$mV		5114	◇2	0mV ±2mV
AM RF 3)						
MW	1494kHz		1494kHz	2106	◇5	 max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz	$\Delta f = \pm 30$kHz V_{RF} as low as possible	198kHz	5103		

ECO6 Sys Cenelec, 190599

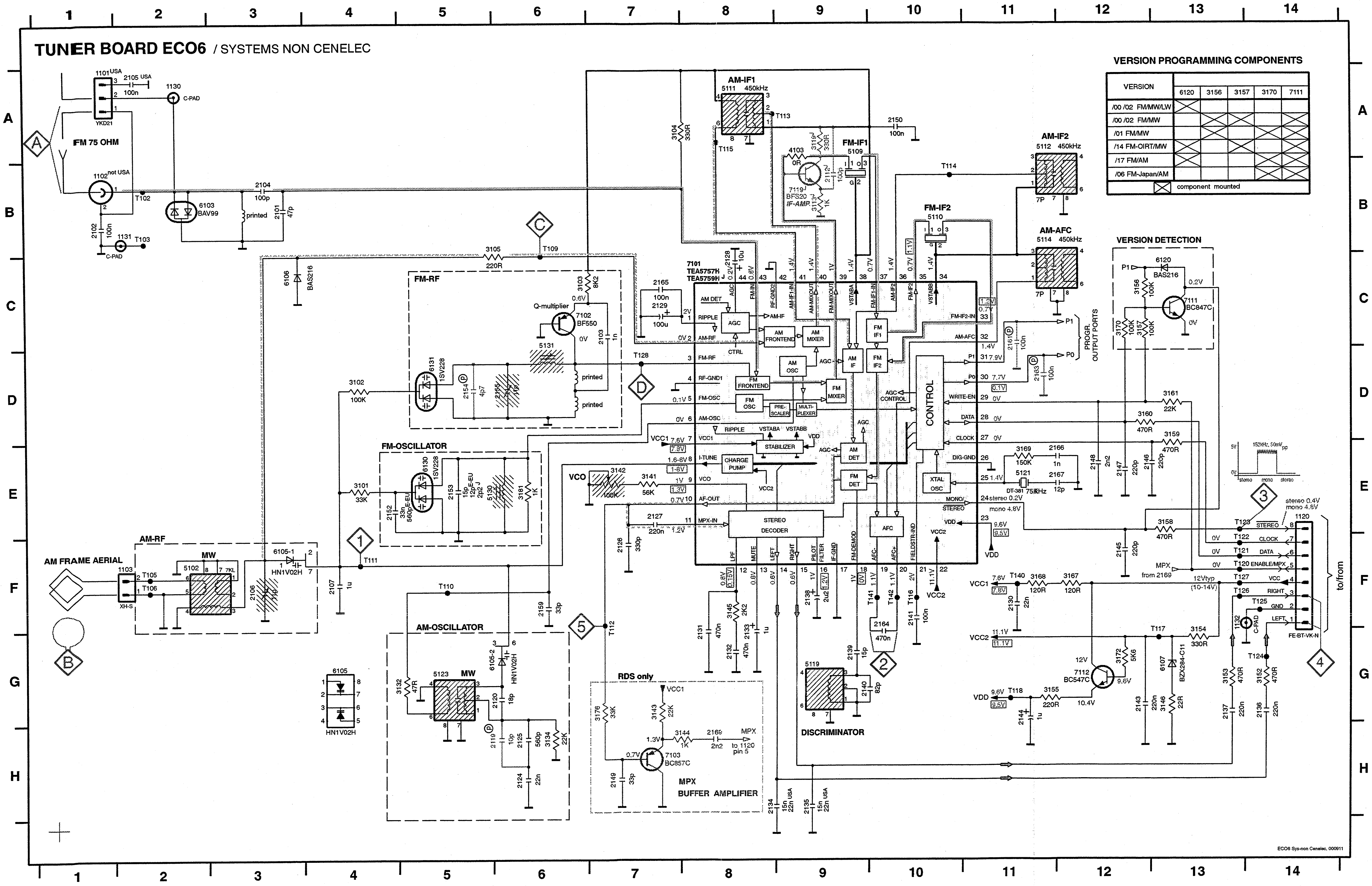
Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation
(input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used!
MW has to be aligned before LW.

↕ Repeat


1
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6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
1101 USA
2105 USA 100n
1130
C-PAD
YKD21
FM 75 OHM
1102 not USA
T102
2104 100p
6103 BAV99
printed
2101 47p
2102 100n
1131
T103
C-PAD
3105 220R
T109
6106 BAS216
FM-RF
Q-multiplier
7102 BF550
3103 8K2
0.6V
0V
2103 1n
5131
6131 1SV228
2154 4p7
2155
printed
printed
T128
3102 100K
FM-OSCILLATOR
6130 1SV228
3101 33K
2152 33p 56p E-EU
2153 15p 12p E-EU 2p2 J
5130
3181 1K
AM-RF
AM FRAME AERIAL
1103
XH-S
T105
T106
MW
5102
6105-1 HN1V02H
2106
T111
2107 1u
T110
AM-OSCILLATOR
3132 47R
5123 MW
6105-2 HN1V02H
2120 18p
2119
2125 10p
560p
3134 22K
2124 22n
6105
HN1V02H
2159 33p
T112
VCO
3142 100K
3141 56K
2127 220n
2126 330p
RDS only
VCC1
3176 33K
3143 22K
3144 1K
2169 2n2
MPX to 1120 pin 5
7103 BC857C
2149 33p
MPX BUFFER AMPLIFIER
AM-IF1
5111 450kHz
T113
T115
3104 330R
4103 0R
3118 330R
7119 BF520 IF-AMP
3113 1K
2112 100p
FM-IF1 5109
2150 100n
T114
AM-IF2
5112 450kHz
7P
FM-IF2
5110
AM-AFC
5114 450kHz
7P
7101
TEA5757H
TEA5759H
2128 10u
2165 100n
2129 100u
AM DET
RIPPLE
AGC
AM-IF
AM FRONTEND
AM MIXER
AM OSC
CTRL
FM FRONTEND
FM OSC
PRE-SCALER
MULTI-PLEXER
FM MIXER
AM IF
FM IF1
FM IF2
AGC CONTROL
CONTROL
STABILIZER
CHARGE PUMP
AM DET
FM DET
STEREO DECODER
AFC
XTAL OSC
AM-RF
FM-RF
RF-GND1
FM-OSC
AM-OSC
VCC1
I-TUNE
VCO
AF-OUT
MPX-IN
FM-IF2-IN
AM-AFC
P1
P0
WRITE-EN
DATA
CLOCK
DIG-GND
MONO/STEREO
VDD
LPF
MUTE
LEFT
RIGHT
PILOT FILTER
IF-GND
FM-DEMOD
AFC-
AFC+
FIELDSTR-IND
VCC2
2161 100n
2163 100n
PROGR. OUTPUT PORTS
3169 150K
2166 1n
5121 DT-381 75kHz
2167 12p
2148 2n2
2147 220p
2146 220p
3145 2K2
2131 470n
2132 470n
2133 1u
2138 2u2
T141
T142
T116
2141 100n
2164 470n
2139 15p
5119
2140 82p
DISCRIMINATOR
2134 15n 22n USA
2135 15n 22n USA
VERSION DETECTION
6120 BAS216
3156 100K
7111 BC847C
3170 100K
3157 100K
3161 22K
3160 470R
3159 470R
3158 470R
2145 220p
VCC1
T140
3168 120R
3167 120R
2130 22n
VCC2
T117
3154 330R
7112 BC547C
3172 5K6
6107 BZX284-C11
3146 22R
VDD
T118
3155 220R
2144 1u
2143 220n
2137 220n
2136 220n
3153 470R
3152 470R
1132 C-PAD
T124
1120
FE-BT-VK-N
T123 STEREO
T122 CLOCK
T121 DATA
T120 ENABLE/MPX
T127 VCC
T126 RIGHT
T125 GND
LEFT
to/from
stereo 0.4V mono 4.8V
MPX from 2169
12Vtyp (10-14V)
152kHz, 50mV pp
stereo mono stereo
ECO6 Sys-non Cenelec, 000911

TUNER BOARD ECO6 / SYSTEMS NON CENELEC

VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	☒				
/00 /02 FM/MW		☒	☒		☒
/01 FM/MW		☒		☒	☒
/14 FM-OIRT/MW	☒		☒		☒
/17 FM/AM	☒			☒	☒
/06 FM-Japan/AM				☒	☒

☒ component mounted

VERSION DETECTION

LEGEND

ⓟ...for provision only
USA ... for USA version only
E-EU ... for East European version only
J ... for Japanese version only

EVM

...V FM mode stereo
...V MW mode
...V LW mode
voltages measured while set is tuned to a strong transmitter

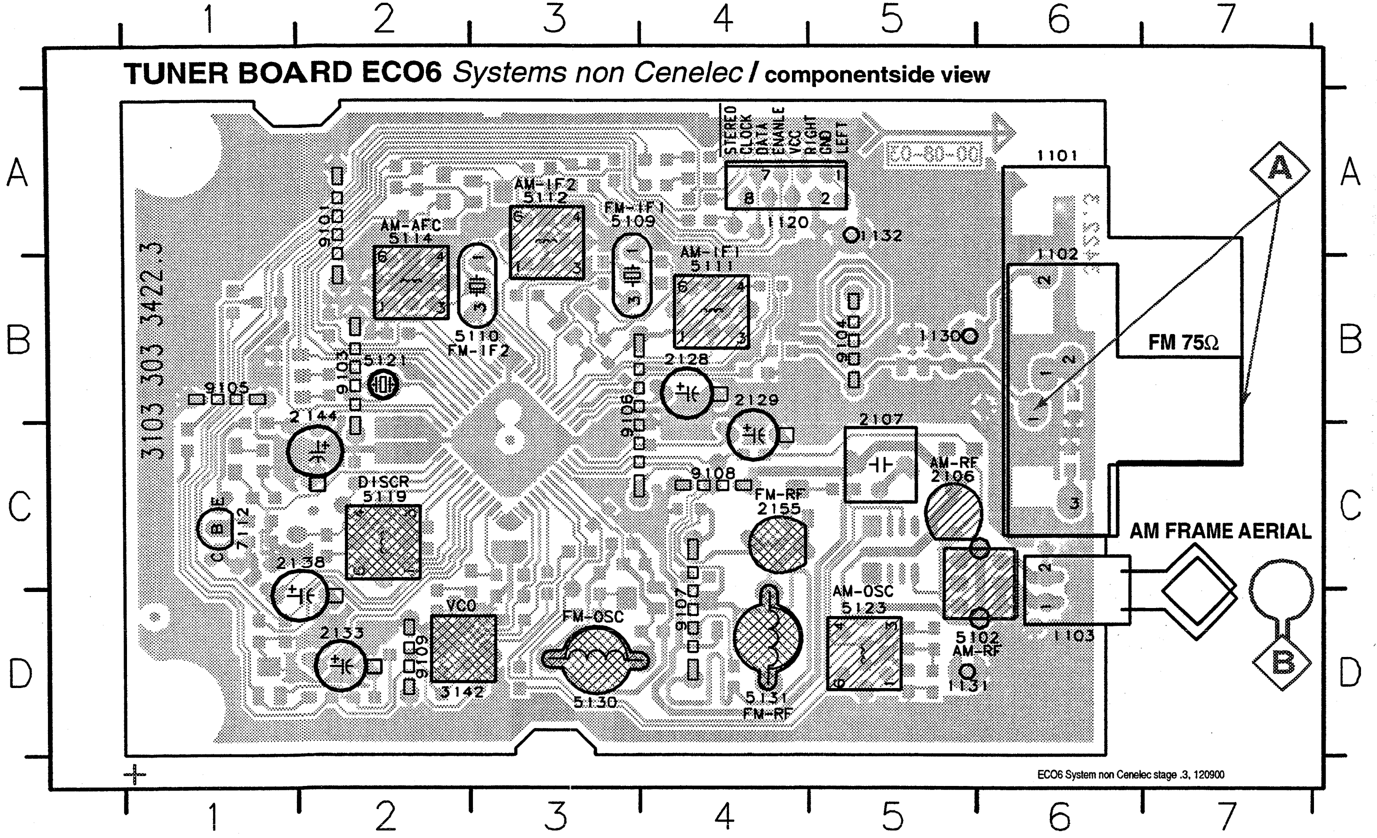
Signal path

- FM
- AM
- MPX (Audio Frequency)
- AF - left/right

1101	A1
1102	B1
1103	F2
1120	E14
1130	A2
1131	B2
1132	G13
2101	B3
2102	B1
2103	C7
2104	B3
2105	A2
2106	F3
2107	F4
2119	H6
2120	G6
2124	H6
2125	H6
2126	F7
2127	E7
2128	C8
2129	C7
2130	F11
2131	G8
2132	G8
2133	G8
2134	H8
2135	H9
2136	G14
2137	G13
2138	F9
2139	G9
2140	G9
2141	F10
2143	G12
2144	G11
2145	F12
2146	E12
2147	E12
2148	E12
2149	H7
2150	A10
2152	E4
2153	E5
2154	D5
2155	D5
2159	F6
2161	C11
2163	D11
2164	F10
2165	C7
2166	E11
2167	E11
2169	H8
3101	E4
3102	D4
3103	C6
3104	A7
3105	B6
3132	G5
3134	H6
3141	E7
3142	E7
3143	G7
3144	H7
3145	F8
3146	G13
3152	G14
3153	G13
3154	G13
3155	G11
3156	C12
3157	C12
3158	E13
3159	D13
3160	D12
3161	D13
3167	F12
3168	F11
3169	E11
3170	C12
3172	G12
3176	G7
3181	E6
5102	F2
5109	B9
5110	B10
5111	A8
5112	A11
5114	B11
5119	G9
5121	E11
5123	G5
5130	E5
5131	C6
6103	B2
6105-1	F3
6105-2	G5
6106	C3
6107	G13
6120	C13
6130	E5
6131	D5
7101	C8
7102	C6
7103	H7
7111	C13
7112	G12
T102	B2
T103	B2
T105	F2
T106	F2
T109	B6
T110	F5
T111	F4
T112	F7
T113	A8
T114	B10
T115	A8
T116	F10
T117	G13
T118	G11
T120	F13
T121	F13
T122	F13
T123	E13
T124	G14
T125	F14
T126	F13
T127	F13
T128	D7
T140	F11
T141	F10
T142	F10

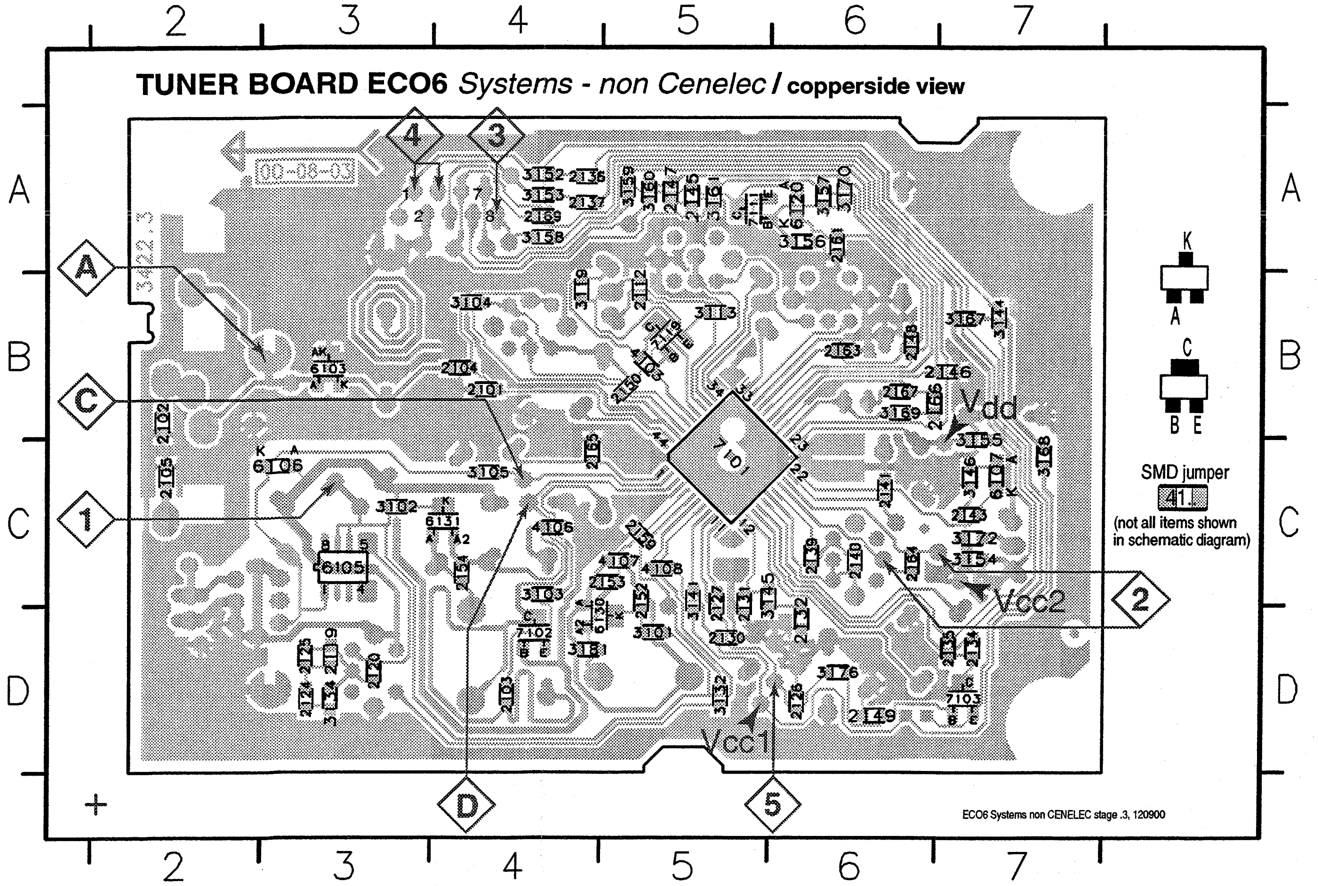
1101	A6	1120	A4	1132	A5	2128	C4	2138	C2	3142	D2	5110	B3	5114	A2	5123	D5	7112	C1	9104	B5	9107	D4
1102	B6	1130	B5	2106	C5	2129	B4	2144	B2	5102	D6	5111	B4	5119	C2	5130	D3	9101	A2	9105	B1	9108	C4
1103	D6	1131	D5	2107	B5	2133	D2	2155	C4	5109	A3	5112	A3	5121	B2	5131	D4	9103	B2	9106	B3	9109	D2

TUNER BOARD ECO6 *Systems non Cenelec* / componentside view


1
2
3
4
5
6
7
A
B
C
D
3103 303 3422.3
AM-AFC 5114
AM-IF2 5112
FM-IF1 5109
AM-IF1 5111
5110 FM-IF2
DISCR 5119
VCO
3142
FM-OSC
5130
5131 FM-RF
FM-RF 2155
AM-OSC 5123
AM-RF 2106
5102 AM-RF
STEREO
CLOCK
DATA
ENABLE
VCC
RIGHT
GND
LEFT
1101
1102
1103
1120
1130
1131
1132
FM 75Ω
AM FRAME AERIAL
A
B
ECO6 System non Cenelec stage .3, 120900

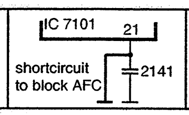
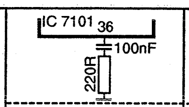
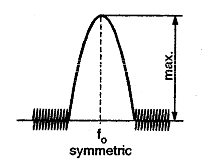
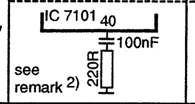
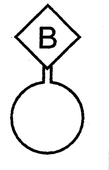
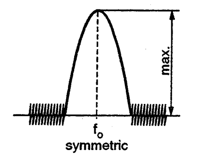
2101	B4	2119	D3	2130	D5	2137	A4	2146	B7	2153	C5	2165	C4	3103	C4	3134	D3	3152	A4	3158	A4	3169	B6	4106	C4	6107	C7	7103	D7
2102	B1	2120	D3	2131	C5	2139	C6	2147	A5	2154	C4	2166	B6	3104	B4	3141	C5	3153	A4	3159	A5	3170	A6	4107	C5	6120	A6	7111	A5
2103	D4	2124	D3	2132	D6	2140	C6	2148	B6	2159	C5	2167	B6	3105	C4	3143	D6	3154	C7	3160	A5	3172	C7	4108	C5	6130	D4	7119	B5
2104	B4	2125	D3	2134	D7	2141	C6	2149	D6	2161	A6	2169	A4	3113	B5	3144	B7	3155	C7	3161	A5	3176	D6	6103	B3	6131	C4		
2105	C1	2126	D6	2135	D7	2143	C7	2150	B5	2163	B6	3101	D5	3119	B5	3145	C5	3156	A6	3167	B7	3181	D4	6105	C3	7101	C5		
2112	B5	2127	C5	2136	A4	2145	A5	2152	C5	2164	C6	3102	C3	3132	D5	3146	C7	3157	A6	3168	C7	4103	B5	6106	C3	7102	D4		

TUNER BOARD ECO6 *Systems - non Cenelec* / copperside view


2
3
4
5
6
7
A
B
C
D
00-08-03
3422.3
4
3
A
C
1
D
5
2
7101
Vdd
Vcc1
Vcc2
K
A
C
B E
SMD jumper
411
(not all items shown in schematic diagram)
ECO6 Systems non CENELEC stage .3, 120900

These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (ECO6 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V 5) (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	◇D	 IC 7101 21 2141 shortcircuit to block AFC	5119	◇2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A mod=1kHz Δf=±22.5kHz	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz 1)
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇C Δf=±10kHz V_{RF} = 0.5mV (as low as possible)	 IC 7101 36 100nF 220R	5111	◇5	 max. f_o symmetric
			 IC 7101 40 100nF 220R see remark 2)	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 2mV		5114	◇2	0 ± 2 mV DC
AM RF 3)						
MW 4) FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz		1494kHz	2106	◇5	 max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	Δf = ±30kHz V_{RF} as low as possible	1500kHz	2106		
	560kHz		560kHz	5102		

ECO6, Sys + PA with frame aerial, 170501

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

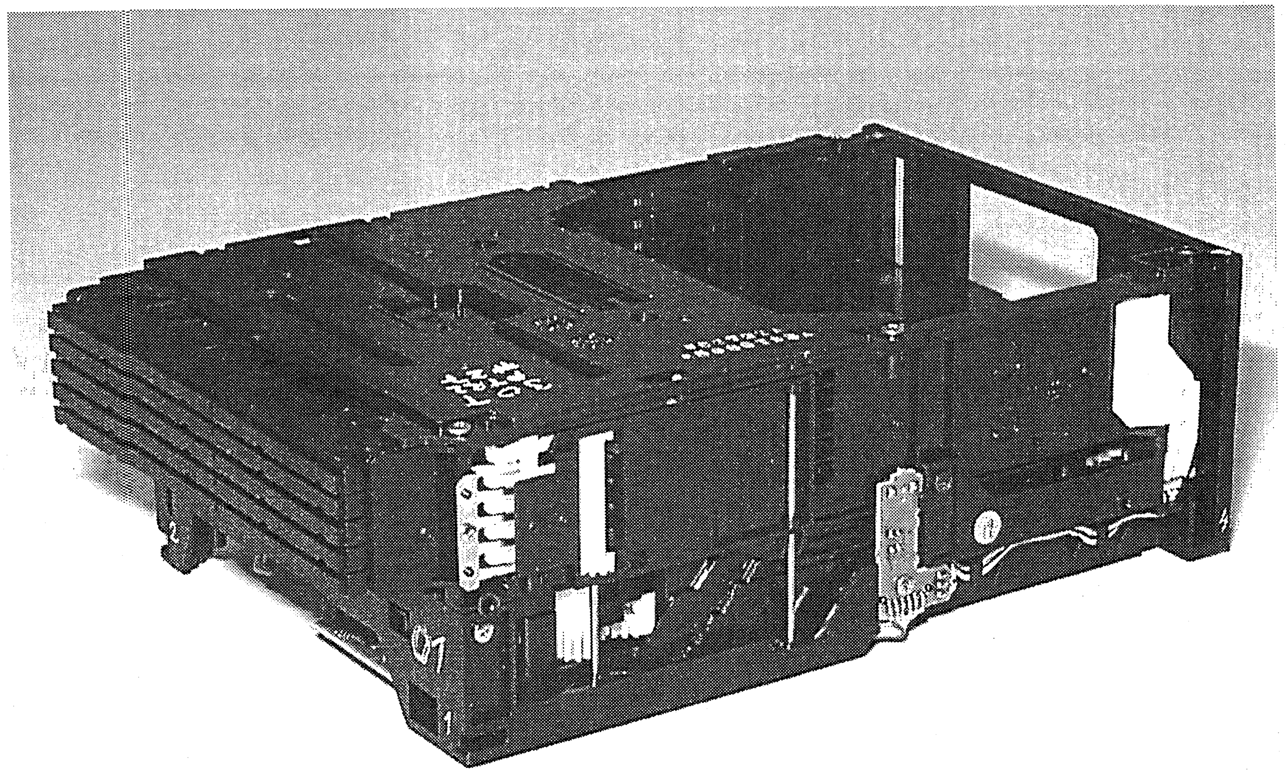
2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used !

4) MW has to be aligned before LW.

↕ Repeat

5) 1.7V ±0.5V when alternative varicap. BB804 is used on pos. 6130, 6131



5DTC Module

(MP3 version)

Layout stage CD .5/ Control .4

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Service Hints

In case of symptom „skipping tracks“ perform following actions:

1. VERIFY THE COMPLAINT

PLAYABILITY CHECK

Use CDDA SBC 444A: 4822 397 30245
TR 14 (600µ black dot) maximum at 01:15
TR 19 (fingerprint)
TR 10 (1000µ wedge)

Use CD-RW Printed Audio Disk 7104 099 96611
TR 3 (Fingerprint)
TR 8 (600µ black dot) maximum at 01:00

- playback of all these tracks without audible disturbance
- jump forward/backward within a reasonable time

2. CLEAN THE LENS

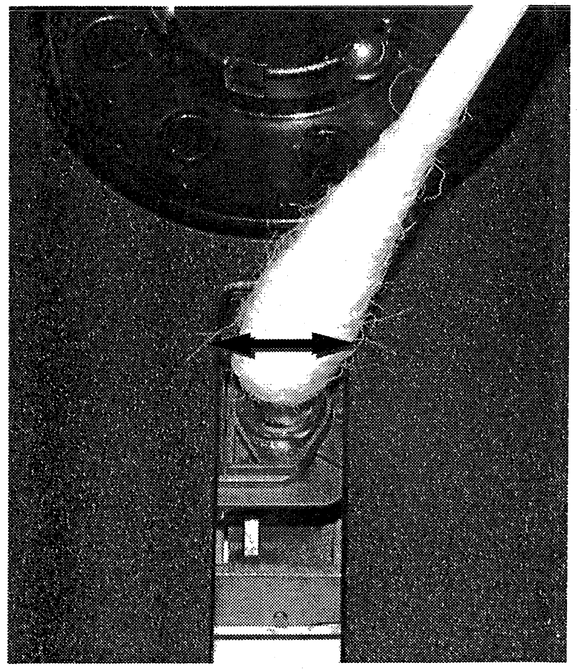
CD DRIVE – LENS CLEANING

Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it in order to avoid that little particles make scratches on the lens.

Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use “KODAK LENS CLEANER CAT 176 71 36”, available in normal photo shops.

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. It is advised to clean the lens gently (don’t press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

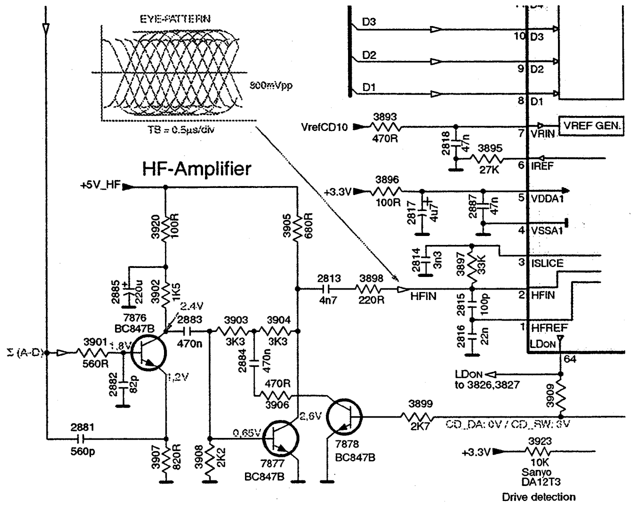
The direction of cleaning must be in the way as indicated in the picture below.



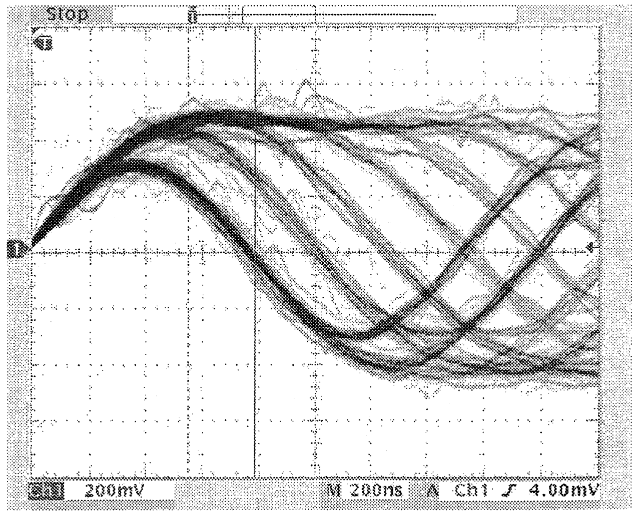
3. MEASURE THE EYE-PATTERN SIGNAL

EYE-PATTERN SIGNAL – JITTER MEASUREMENT

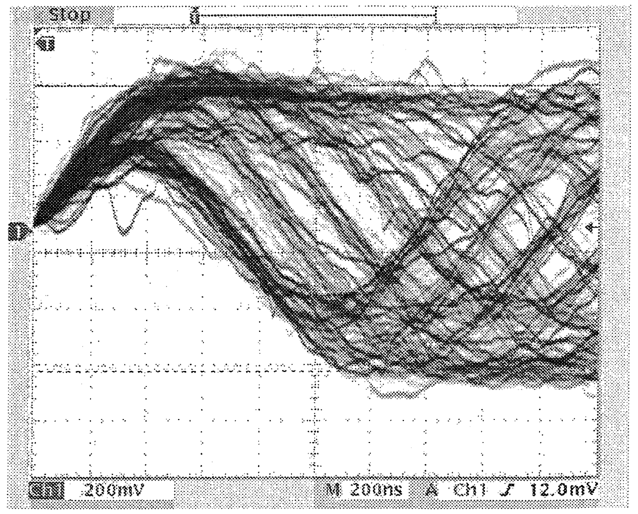
Measure the signal direct on resistor 3898 using an oscilloscope (see also chapter 10-9).


EYE-PATTERN
800mVpp
TB = 0.5µs/div
HF-Amplifier
+5V_HF
3920 100R
3905 680R
2885 220u
3902 1K5
7876 BC847B
2.4V
2883 470n
3903 3K3
3904 3K3
Σ (A-D)
3901 560R
1.8V
1.2V
2882 82p
2884 470n
470R 3906
2881 560p
3907 820R
3908 2K2
0.65V
7877 BC847B
2.6V
7878 BC847B
2813 4n7
3898 220R
HFIN
D3
D2
D1
10 D3
9 D2
8 D1
VrefCD10
3893 470R
2818 47n
3895 27K
VREF GEN.
7 VRIN
6 IREF
+3.3V
3896 100R
2817 4u7
2887 47n
5 VDDA1
4 VSSA1
2814 3n3
3897 33K
3 ISLICE
2 HFIN
2815 100p
2816 22n
1 HFREF
LDON
64
LDON to 3826,3827
3909
3899 2K7
CD_DA: 0V / CD_RW: 3V
+3.3V
3923 10K
Sanyo DA12T3
Drive detection

See below examples of the signal. Amplitude should read at least 700mVpp using SBC444A.


Stop
Ch1 200mV
M 200ns A Ch1 ƒ 4.00mV

good


Stop
Ch1 200mV
M 200ns A Ch1 ƒ 12.0mV

bad

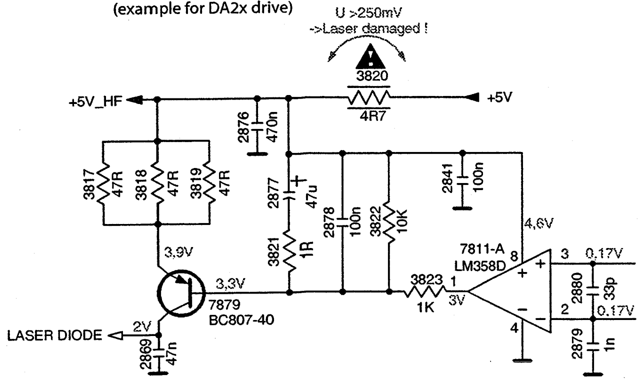
If the oscilloscope shows a signal like the ‘bad’ one, and/or the amplitude decreases within 1minute - the CD drive has to be replaced.

4. *MEASURE THE LASER CURRENT*

CD DRIVE – LASER CURRENT MEASUREMENT

The laser current can be measured as a voltage drop on resistor 3820. Typical value 170 - 190mV for CD-DA respectively 200 - 220mV for CD-RW.

Laser power control
(example for DA2x drive)


U >250mV
->Laser damaged !
3820
4R7
+5V_HF
+5V
2876
470n
3817 47R
3818 47R
3819 47R
2877 47u
2878 100n
3822 10K
2841 100n
3821 1R
4,6V
3,9V
3,3V
7879
BC807-40
7811-A
LM358D
3823
1K
3V
2880 33p
2879 1n
0,17V
0,17V
2V
LASER DIODE
2869 47n

5. *MEASURE THE OFFSETS OF THE CD-DRIVE*

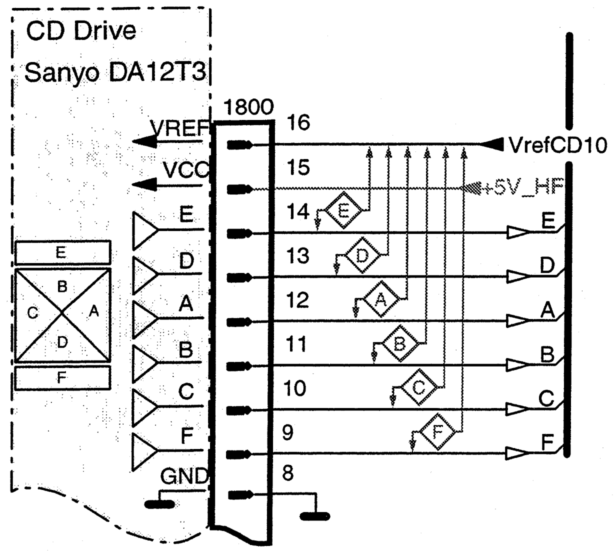
CD DRIVE – OFFSET MEASUREMENT

Each photodiode of the CD-drive may have an offset. This offset has to be compensated by the signal processor. A high offset of the CD-drive leads to poor playability of some CDs (skipping tracks).

Start the **Service Test Program** - section „Focus Test" without a CD. Focus sensitivity = CD-RW.

Use a DC Millivoltmeter for measurement. The offsets can be measured direct on the connector. See drawing below.

The values from diode A-D should read 0±10mV. Diodes E and F are less critical.


CD Drive
Sanyo DA12T3
1800
VREF
VCC
E
D
A
B
C
F
GND
16
15
14
13
12
11
10
9
8
VrefCD10
+5V_HF
E
D
A
B
C
F

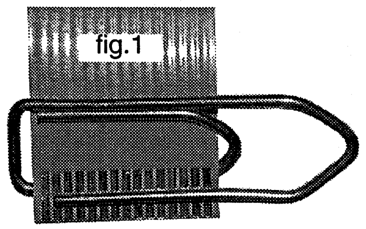
If one of the offsets is higher than ±10mV the CD drive has to be replaced.

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

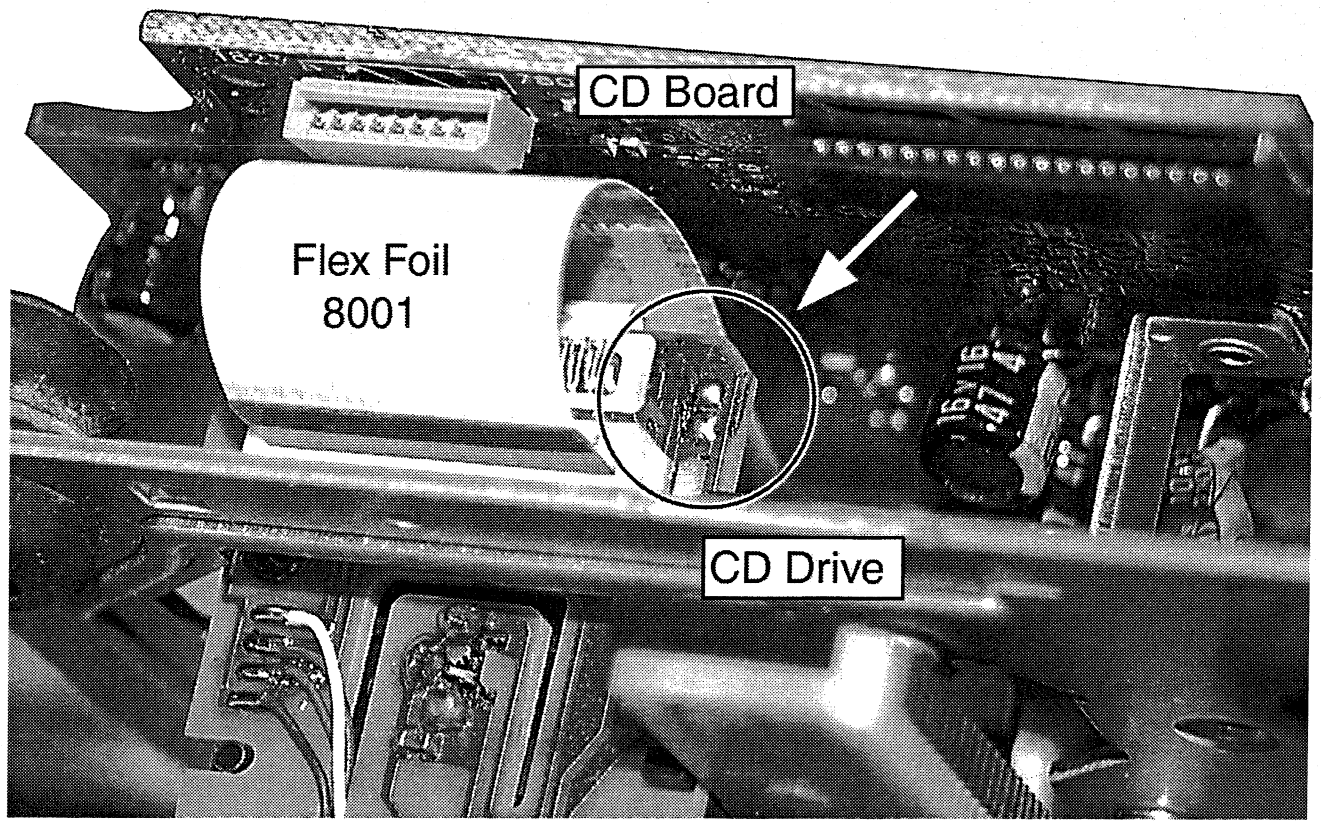
The CD drive forms a compact building block with the CD Board.



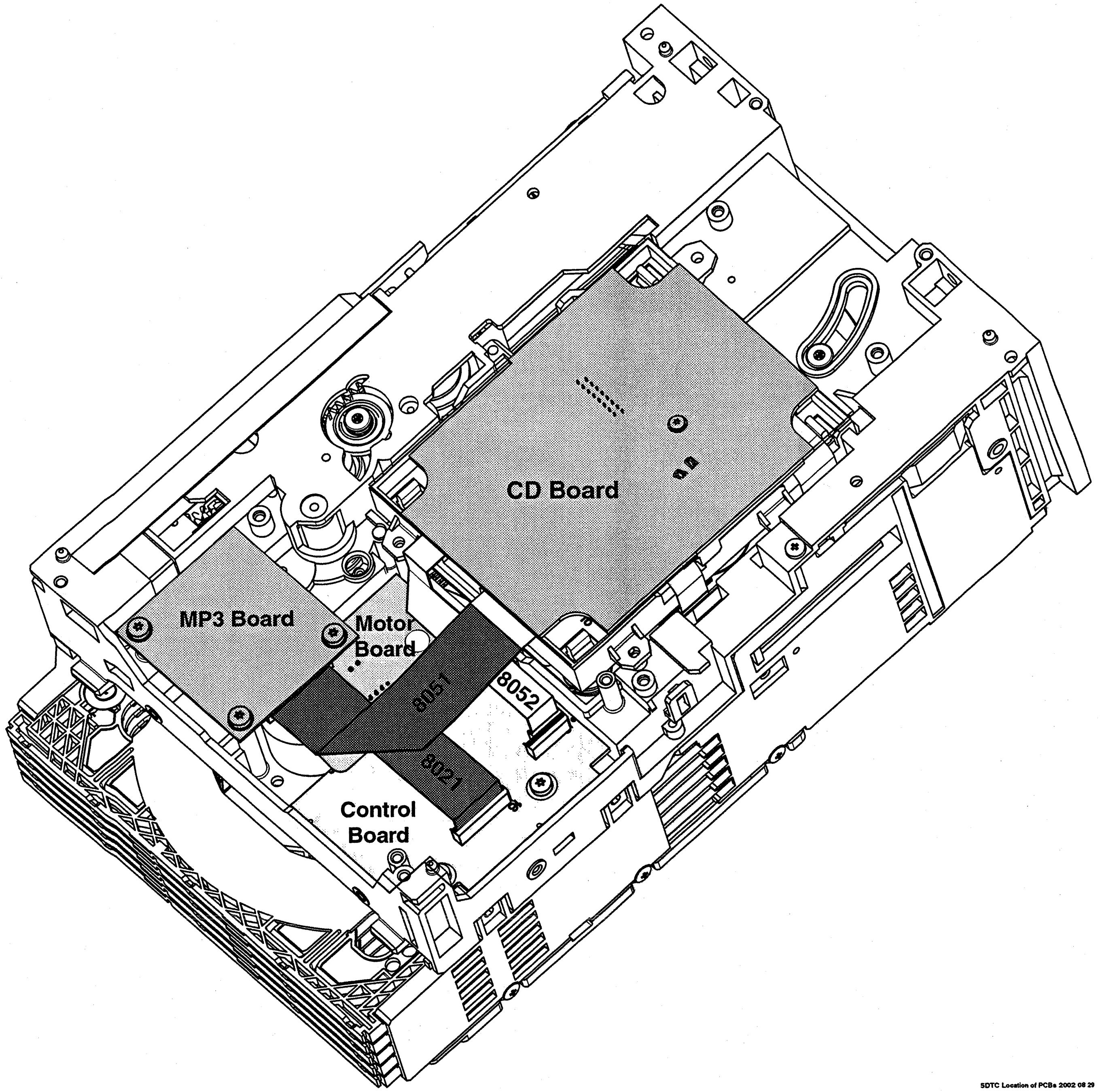
The following steps have to be done when replacing the CD mechanism:

1. Desolder disc and slide motor
2. Loosen 2x screw
1. Disconnect flexfoil from old CD drive
2. Put a paperclip over contacts of flexfoil to short-circuit the contacts (fig.1)
3. Remove old CD drive
4. Mount new CD drive to CD board
5. Solder disc and slide motor **after** fixing the drive to the board
5. Move slide outside
6. Remove paperclip from flexfoil
7. Connect flexfoil to new CD drive
8. Remove ESD-protection (solder joint) from laserunit (see picture below)

Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.

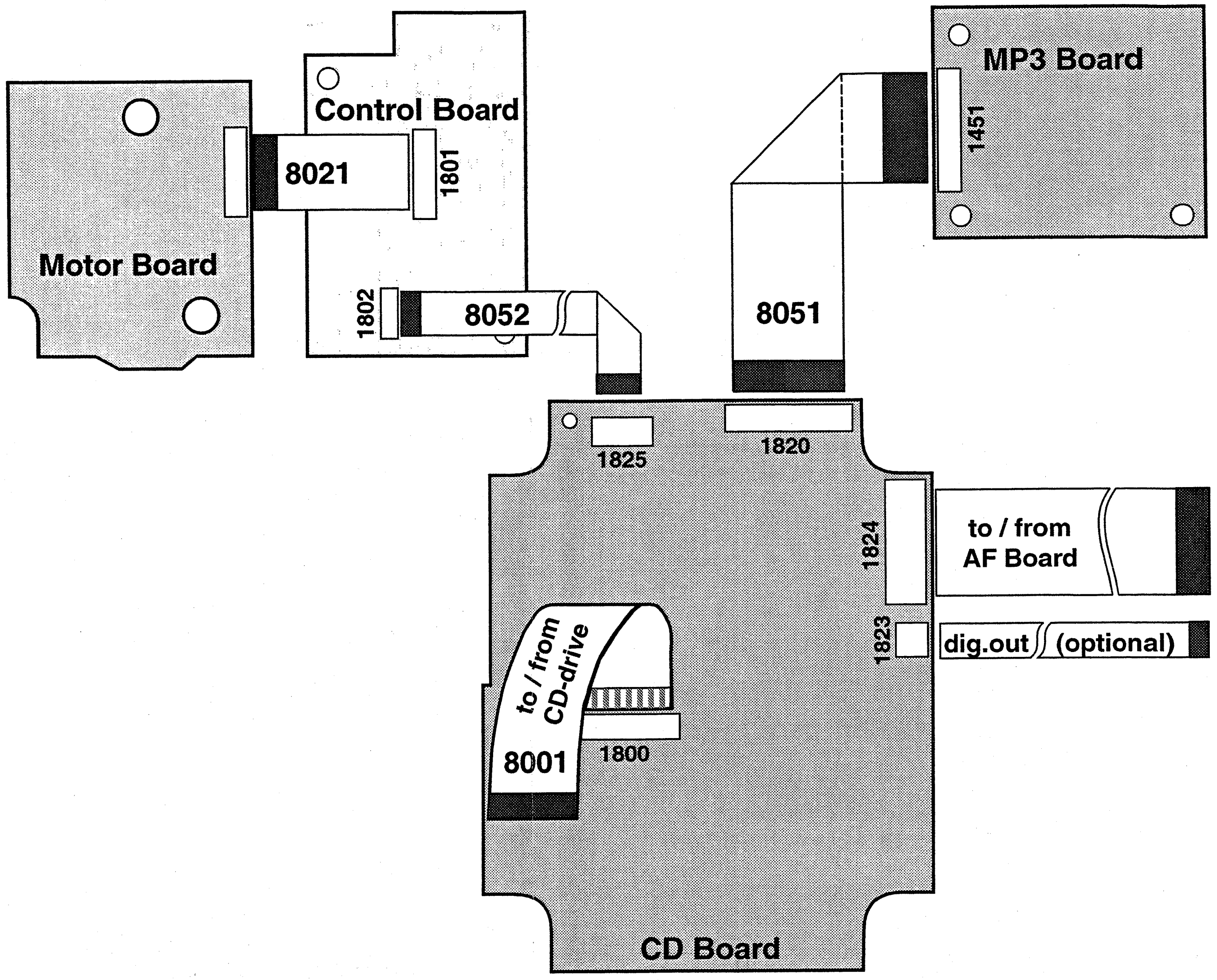

CD Board
Flex Foil
8001
CD Drive

Location of Printed Circuit Boards


CD Board
MP3 Board
Motor Board
Control Board
8051
8052
8021

5DTC Location of PCBs 2002 08 29

Wiring Diagram 5DTC Module


Motor Board
Control Board
MP3 Board
CD Board
8021
1801
1802
8052
8051
1451
1825
1820
1824
to / from AF Board
1823
dig.out
(optional)
to / from CD-drive
8001
1800

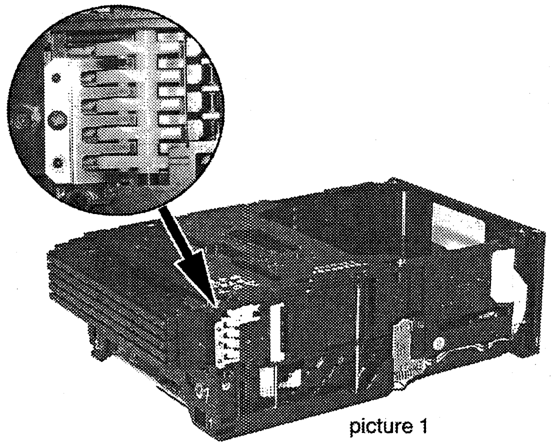
5DTC Wiring Diagram 2002 08 30

The FFC-Cables are available as sparepart.

8001	3103 308 93090	FFC CABLE 16Pin 80mm BD	Connection from CD Board to CD Drive
8051	3103 308 93100	FFC-CABLE 19Pin 90mm AD	Connection from CD Board to MP3 Board
8052	3103 308 93120	FFC CABLE 8Pin 80mm BD	Connection from CD Board to Control Board
8021	3103 308 93110	FFC-CABLE 16Pin 60mm AD	Connection from Control Board to Motor Board

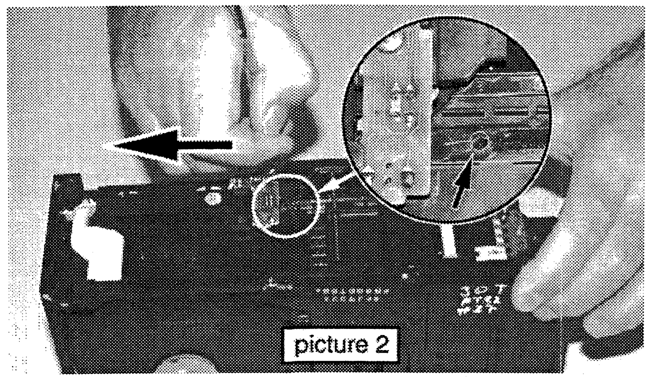
Emergency opening of the trays

The trays of the 5DTC are mechanically locked.



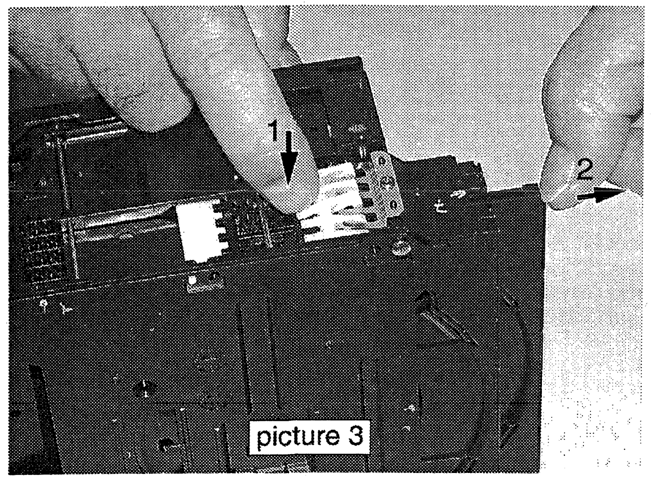
picture 1

To open tray 1, 2 and 3 move lever (pos 29) backwards (e.g. with a screwdriver - see picture 2) to its endposition.



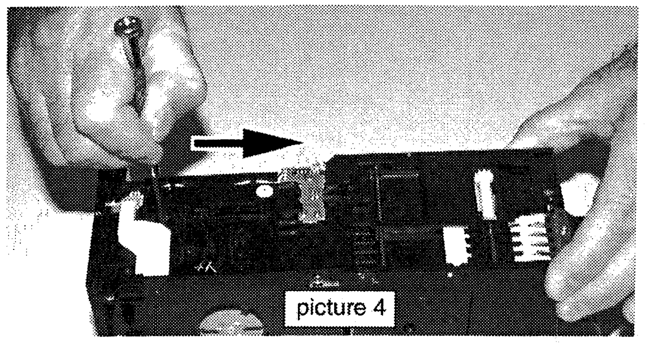
picture 2

Release the locking mechanism and pull out the tray (see picture 3).



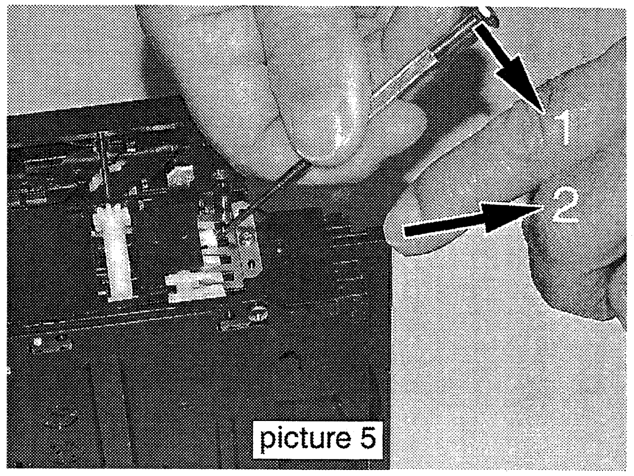
picture 3

To open tray 4 and 5 move lever (pos 29) forward to its endposition (see picture 4).



picture 4

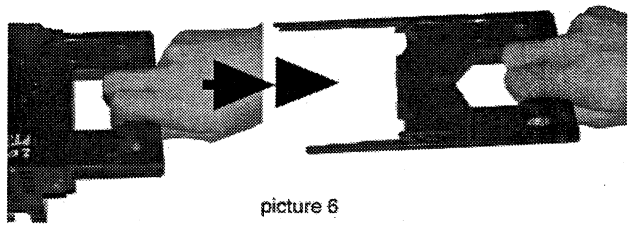
Release snap as shown in picture 5 and pull tray out.



picture 5

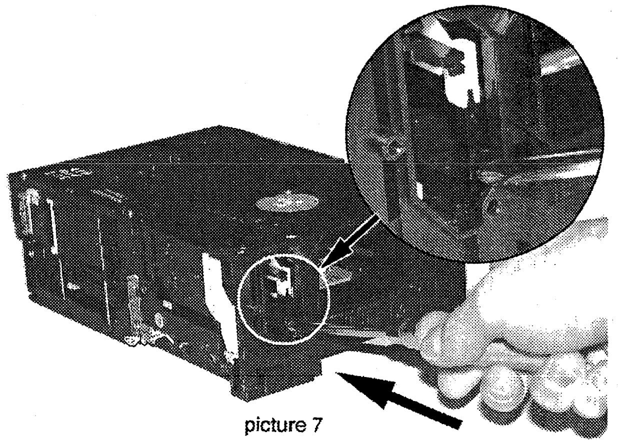
To remove a CD from Play Position perform following steps:

1. Open tray 1 as described before.
2. Tear the tray out with speed (see picture 6). The tray can be inserted aftewards without any alignment.



picture 6

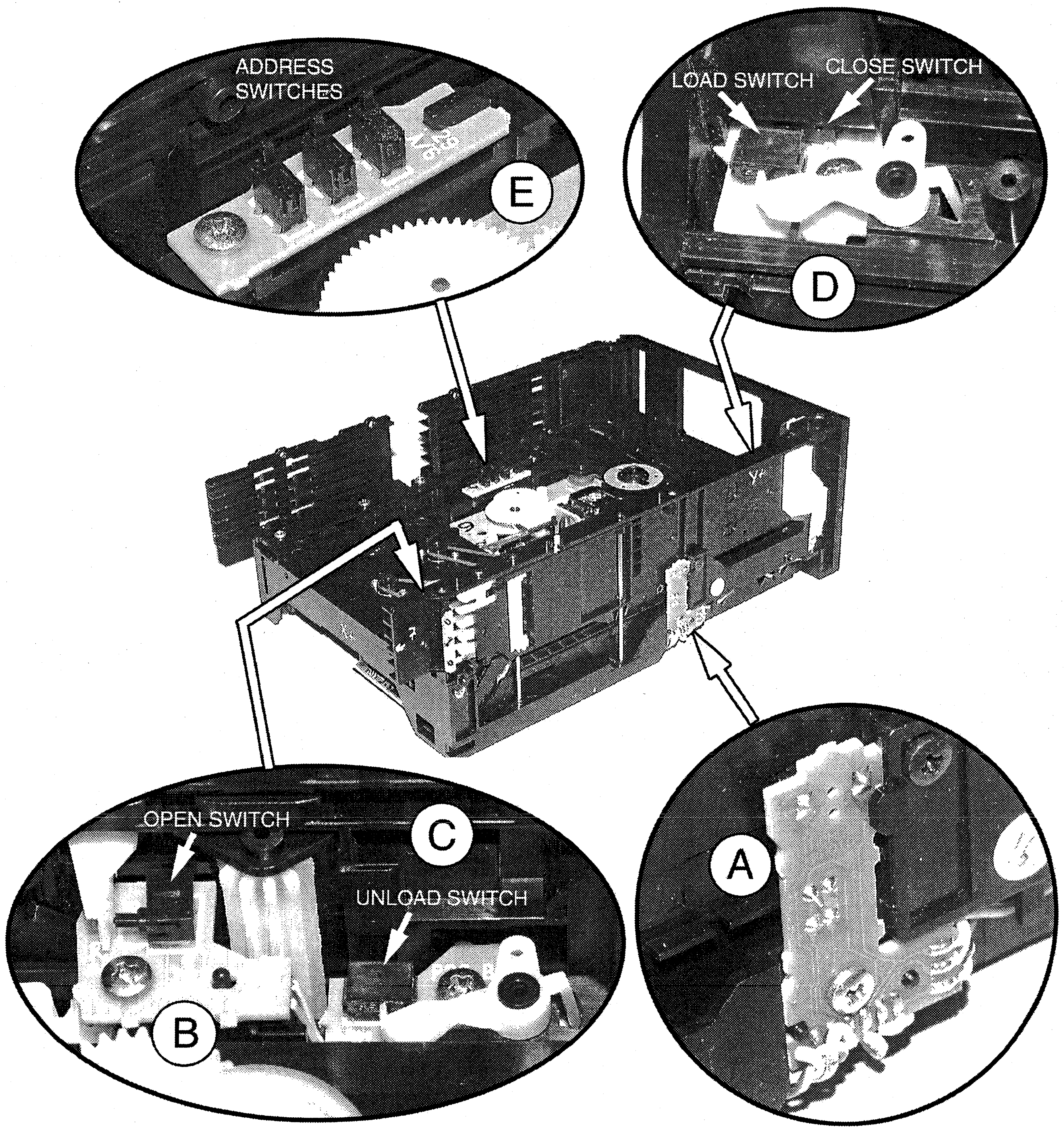
3. Move lever (pos 29) forward to its endposition (see picture 4).
4. Push lever (pos 31) forward (see picture 7).



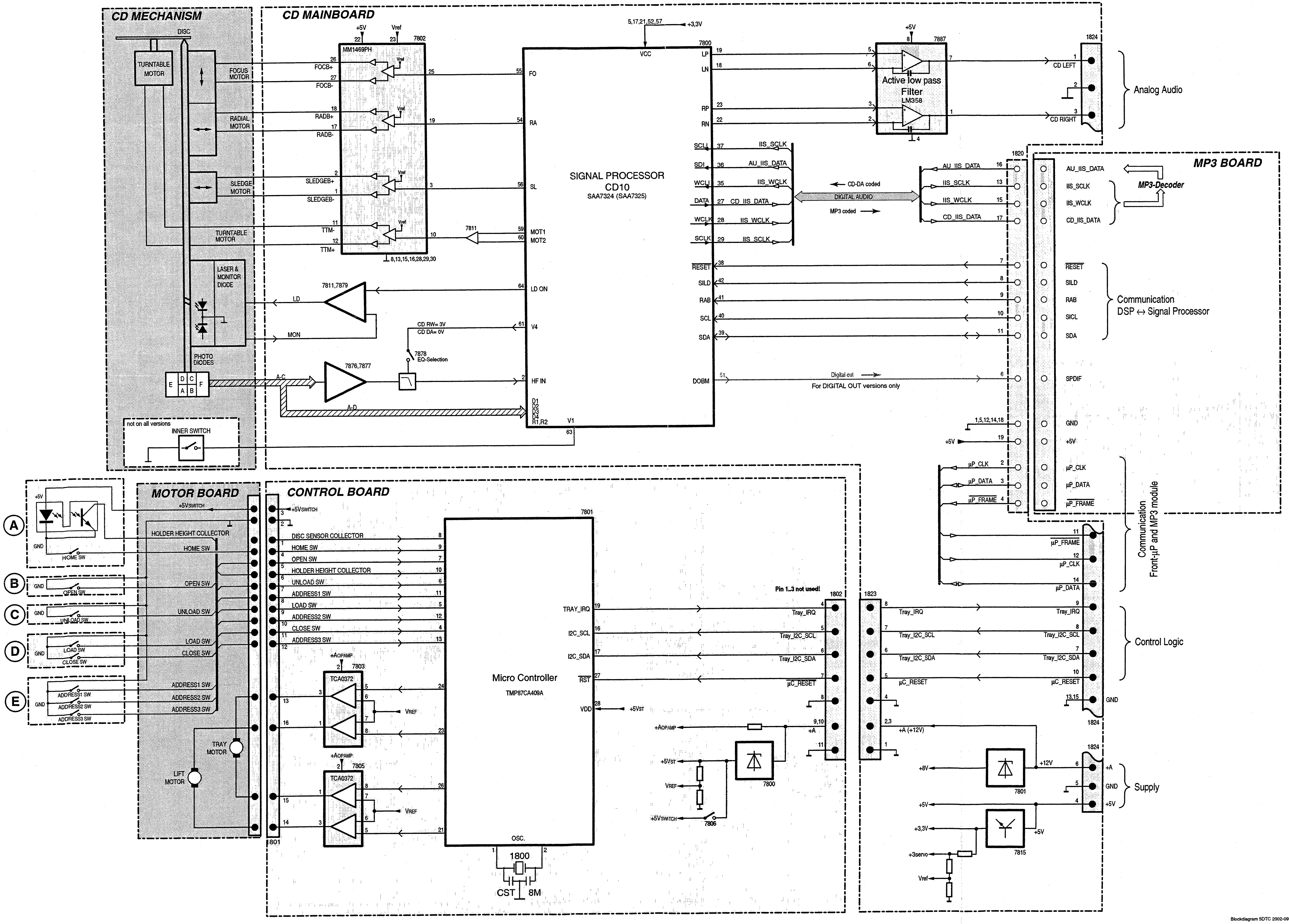
picture 7

5. Remove CD.

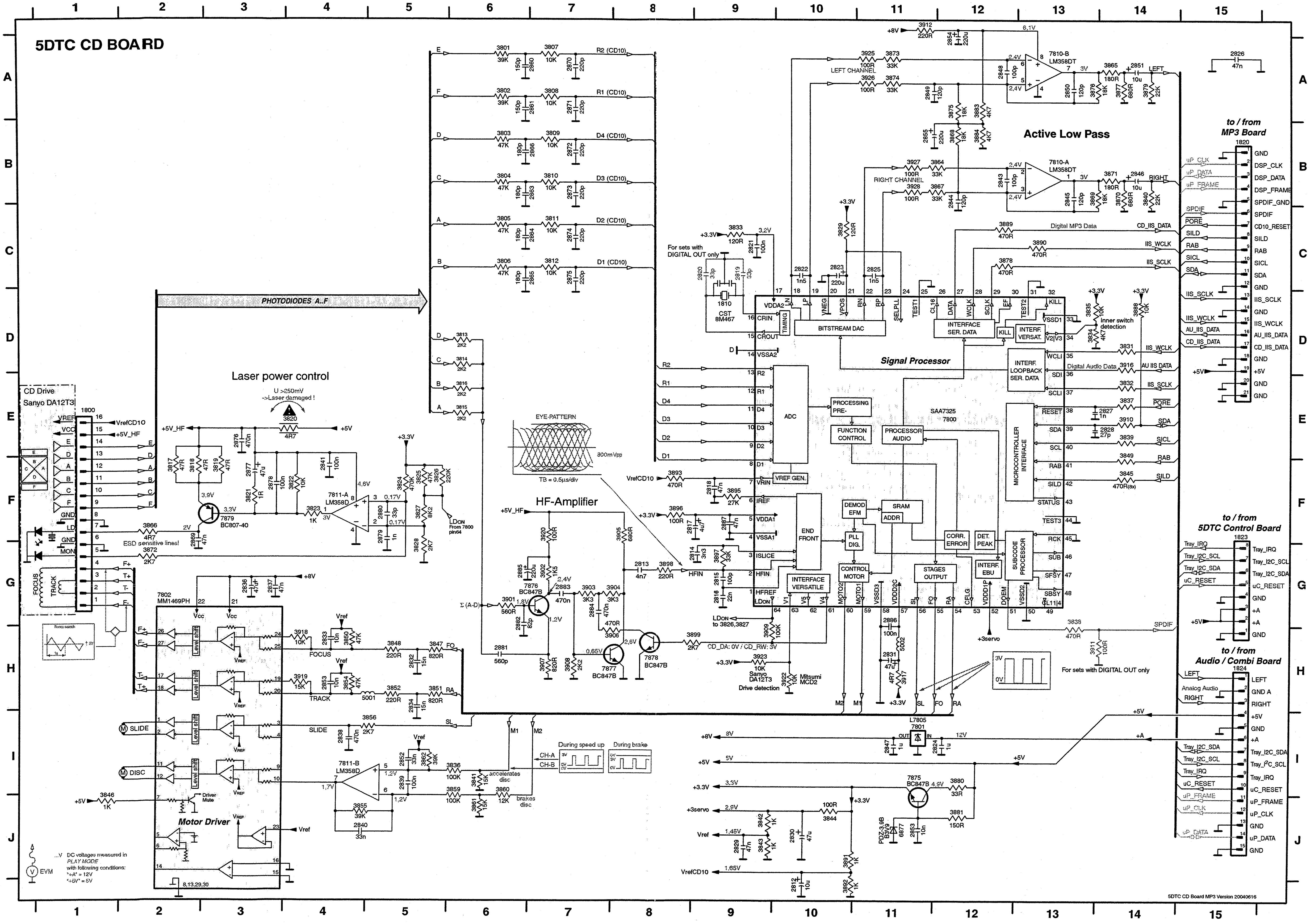
Location of switches



BLOCK DIAGRAM 5DTC MP3 Version


CD MECHANISM
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER & MONITOR DIODE
PHOTO DIODES
E D C F A B
not on all versions
INNER SWITCH
CD MAINBOARD
+5V
Vref
7802
MM1469PH
FOCB+
FOCB-
RADB+
RADB-
SLEDGEB+
SLEDGEB-
TTM-
TTM+
8,13,15,16,28,29,30
7811
7811,7879
LD
MON
CD RW= 3V
CD DA= 0V
7878
EQ-Selection
7876,7877
A-C
A-D
5,17,21,52,57
+3,3V
7800
VCC
SIGNAL PROCESSOR
CD10
SAA7324 (SAA7325)
FO
RA
SL
MOT1
MOT2
LD ON
V4
HF IN
D1 D2 D3 D4 R1,R2
V1
LP
LN
RP
RN
SCLI
SDI
WCLI
DATA
WCLK
SCLK
IIS_SCLK
AU_IIS_DATA
IIS_WCLK
CD_IIS_DATA
IIS_WCLK
IIS_SCLK
RESET
SILD
RAB
SCL
SDA
DOBM
Digital out
For DIGITAL OUT versions only
CD-DA coded
DIGITAL AUDIO
MP3 coded
+5V
7887
Active low pass Filter
LM358
1824
CD LEFT
CD RIGHT
Analog Audio
1820
AU_IIS_DATA
IIS_SCLK
IIS_WCLK
CD_IIS_DATA
1,5,12,14,18
+5V
µP_CLK
µP_DATA
µP_FRAME
MP3 BOARD
AU_IIS_DATA
IIS_SCLK
IIS_WCLK
CD_IIS_DATA
MP3-Decoder
RESET
SILD
RAB
SICL
SDA
Communication DSP ↔ Signal Processor
SPDIF
GND
+5V
µP_CLK
µP_DATA
µP_FRAME
Communication Front-µP and MP3 module
MOTOR BOARD
+5VSWITCH
HOLDER HEIGHT COLLECTOR
HOME SW
OPEN SW
UNLOAD SW
LOAD SW
CLOSE SW
ADDRESS1 SW
ADDRESS2 SW
ADDRESS3 SW
TRAY MOTOR
LIFT MOTOR
A
B
C
D
E
GND
HOME SW
OPEN SW
UNLOAD SW
LOAD SW
CLOSE SW
ADDRESS1 SW
ADDRESS2 SW
ADDRESS3 SW
1801
CONTROL BOARD
+5VSWITCH
DISC SENSOR COLLECTOR
HOME SW
OPEN SW
HOLDER HEIGHT COLLECTOR
UNLOAD SW
ADDRESS1 SW
LOAD SW
ADDRESS2 SW
CLOSE SW
ADDRESS3 SW
7801
Micro Controller
TMP87CA409A
TRAY_IRQ
I2C_SCL
I2C_SDA
RST
VDD
+5VST
OSC.
1800
CST 8M
+AOPAMP
7803
TCA0372
7805
TCA0372
VREF
Pin 1..3 not used!
1802
Tray_IRQ
Tray_I2C_SCL
Tray_I2C_SDA
µC_RESET
+A
+AOPAMP
+5VST
VREF
+5VSWITCH
7806
7800
1823
Tray_IRQ
Tray_I2C_SCL
Tray_I2C_SDA
µC_RESET
+A (+12V)
Tray_IRQ
Tray_I2C_SCL
Tray_I2C_SDA
µC_RESET
13,15
GND
µP_FRAME
µP_CLK
µP_DATA
Control Logic
+8V
+12V
7801
+5V
+3,3V
+5V
7815
+3servo
Vref
+A
GND
+5V
Supply

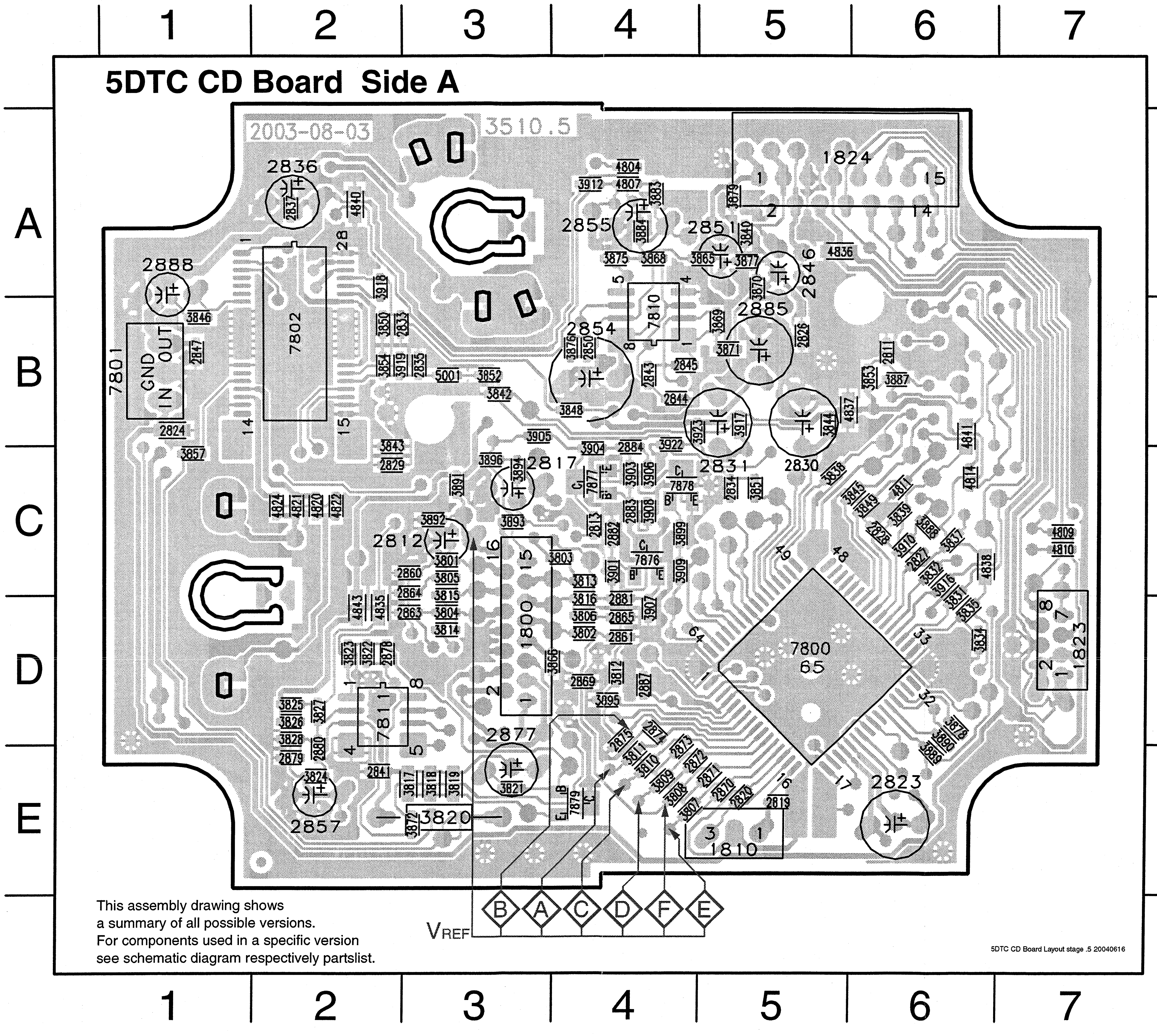
5DTC CD BOARD


Laser power control
U >250mV
->Laser damaged !
CD Drive
Sanyo DA12T3
PHOTODIODES A..F
EYE-PATTERN
300mVpp
TB = 0.5µs/div
HF-Amplifier
Active Low Pass
LEFT CHANNEL
RIGHT CHANNEL
7810-B LM358DT
7810-A LM358DT
Signal Processor
SAA7325 7800
BITSTREAM DAC
ADC
PROCESSING PRE-
FUNCTION CONTROL
PROCESSOR AUDIO
INTERFACE SER. DATA
INTERF. LOOPBACK SER. DATA
MICROCONTROLLER INTERFACE
SUBCODE PROCESSOR
END FRONT
DEMOD EFM
SRAM
ADDR
PLL DIG.
CONTROL MOTOR
STAGES OUTPUT
INTERFACE VERSATILE
CORR. ERROR
DET. PEAK
INTERF. EBU
VREF GEN.
TIMING
KILL
INTERF. VERSAT.
Inner switch detection
For sets with DIGITAL OUT only
CST 8M467
Digital MP3 Data
Digital Audio Data
Motor Driver
7802 MM1469PH
Level shift
FOCUS
TRACK
SLIDE
DISC
Driver Mute
7811-A LM358D
7811-B LM358D
7879 BC807-40
7876 BC847B
7877 BC847B
7878 BC847B
7875 BC847B
L7805 7801
ESD sensitive lines!
LDON From 7800 pin64
LDON to 3826,3827
CD_DA: 0V / CD_RW: 3V
Sanyo DA12T3 Drive detection
Mitsumi MCD2
accelerates disc
brakes disc
During speed up
During brake
CH-A
CH-B
to / from MP3 Board
1820
GND
DSP_CLK
DSP_DATA
DSP_FRAME
SPDIF_GND
SPDIF
CD10_RESET
SILD
RAB
SICL
SDA
IIS_SCLK
IIS_WCLK
AU_IIS_DATA
CD_IIS_DATA
+5V
to / from 5DTC Control Board
1823
Tray_IRQ
Tray_I2C_SCL
Tray_I2C_SDA
uC_RESET
+A
to / from Audio / Combi Board
1824
LEFT
GND A
RIGHT
Analog Audio
uP_FRAME
uP_CLK
uP_DATA
PDZ-3.9B
...V DC voltages measured in PLAY MODE with following conditions: "+A" = 12V "+5V" = 5V
EVM
5DTC CD Board MP3 Version 20040616

MAPPING FOR CIRCUIT DIAGRAM

1800	E1	3827	F5
1810	D9	3828	G5
1820	B15	3829	C10
1823	F15	3831	D14
1824	H15	3832	E14
2187	F9	3833	C9
2812	J10	3834	D13
2813	G8	3835	D13
2814	G9	3836	I6
2815	G9	3837	E14
2816	G9	3838	G13
2817	F9	3839	E14
2818	F9	3840	B14
2819	C9	3841	I6
2820	C9	3842	J9
2821	C9	3843	J9
2822	C10	3844	J10
2823	C10	3845	F14
2824	I12	3846	J1
2825	C11	3847	H5
2826	A15	3848	H5
2827	E13	3849	F14
2828	E13	3850	H4
2829	J9	3851	H5
2830	J10	3852	H5
2831	H11	3854	H4
2832	H5	3855	J4
2833	H4	3856	I5
2834	H5	3859	I6
2836	G3	3860	I6
2837	G3	3861	J6
2838	I4	3862	I5
2839	I5	3864	B11
2840	J4	3865	A14
2841	F4	3866	F2
2843	B12	3867	B11
2844	B12	3868	B12
2845	B13	3869	B13
2846	B14	3870	B14
2847	I11	3871	B14
2848	A12	3872	G2
2849	A11	3873	A11
2850	A13	3874	A11
2851	A14	3875	A12
2852	I5	3876	A13
2853	H4	3877	A14
2853	J11	3878	C12
2854	A12	3879	A14
2855	B11	3880	I12
2860	A6	3881	J12
2861	A6	3883	A12
2863	B6	3884	B12
2864	C6	3888	D14
2865	C6	3889	C12
2866	B6	3890	C13
2869	F2	3891	J10
2870	A7	3892	J10
2871	A7	3893	F8
2872	B7	3895	F9
2873	B7	3896	F8
2874	C7	3897	G9
2875	C7	3898	G8
2876	E3	3899	H8
2877	F3	3901	G6
2878	F3	3902	G7
2879	F5	3903	G7
2880	F5	3904	G8
2881	H6	3905	F8
2882	G6	3906	H8
2884	G7	3907	H7
2885	G6	3908	H7
2886	G11	3909	H9
2893	G7	3910	E14
3801	A6	3911	H13
3802	A6	3912	A11
3803	B6	3917	H11
3804	B6	3918	H4
3805	C6	3919	H4
3806	C6	3920	F7
3807	A7	3922	H10
3808	A7	3923	H9
3809	B7	3925	A11
3810	B7	3926	A11
3811	C7	3927	B11
3812	C7	3928	B11
3813	D6	5001	H5
3814	D6	5002	H11
3815	E6	6877	J11
3816	D14	7800	D11
3816	E6	7801	I11
3817	F2	7802	G2
3818	F2	7810-A	B13
3819	F3	7810-B	A13
3820	E4	7811-A	F4
3821	F3	7811-B	I4
3822	F4	7875	I11
3823	F4	7876	G7
3824	F5	7877	H8
3825	F5	7878	H8
3826	F5	7879	F3

5DTC CD Board Side A


1
2
3
4
5
6
7
A
B
C
D
E
2003-08-03
3510.5
1824
1
15
2
14
2836
2837
4840
28
1
2888
3846
7801
GND
IN
OUT
2847
2824
3857
7802
14
15
3918
3850
2833
3854
3919
2835
5001
3852
3842
3843
2829
4804
4807
3912
3883
3879
2855
3884
2851
3840
3875
3868
3865
3877
4836
2846
3870
5
4
7810
8
1
2885
3869
2854
3876
2850
3871
2826
2811
2845
2843
2844
3853
3887
3848
3923
3917
3844
4837
2831
2830
3905
3904
2884
3922
4841
4814
3896
3894
2817
3891
7877
3903
3906
7878
2834
3851
3838
4824
4821
4820
4822
3893
3892
2812
3801
2813
2883
3908
3899
3845
3849
4811
3839
3828
3888
3837
3910
2827
3832
3916
3831
3835
4838
2860
3805
2864
3815
2863
3804
3814
4843
4835
16
15
1800
3803
3813
3816
3806
3802
2881
2865
2861
3907
7876
3901
3909
49
48
7800
65
64
33
32
17
16
3834
4809
4810
8
7
1823
2
1
3823
3822
2878
3866
2869
3812
2887
3895
1
8
7811
4
5
3825
3826
3827
3828
2880
2879
3824
2857
2841
3817
3818
3819
3872
3820
2877
3821
7879
2875
2874
3811
3810
3873
3809
2872
3808
2871
3807
2870
3820
2819
3
1
1810
3878
3880
3889
2823
VREF
B
A
C
D
F
E

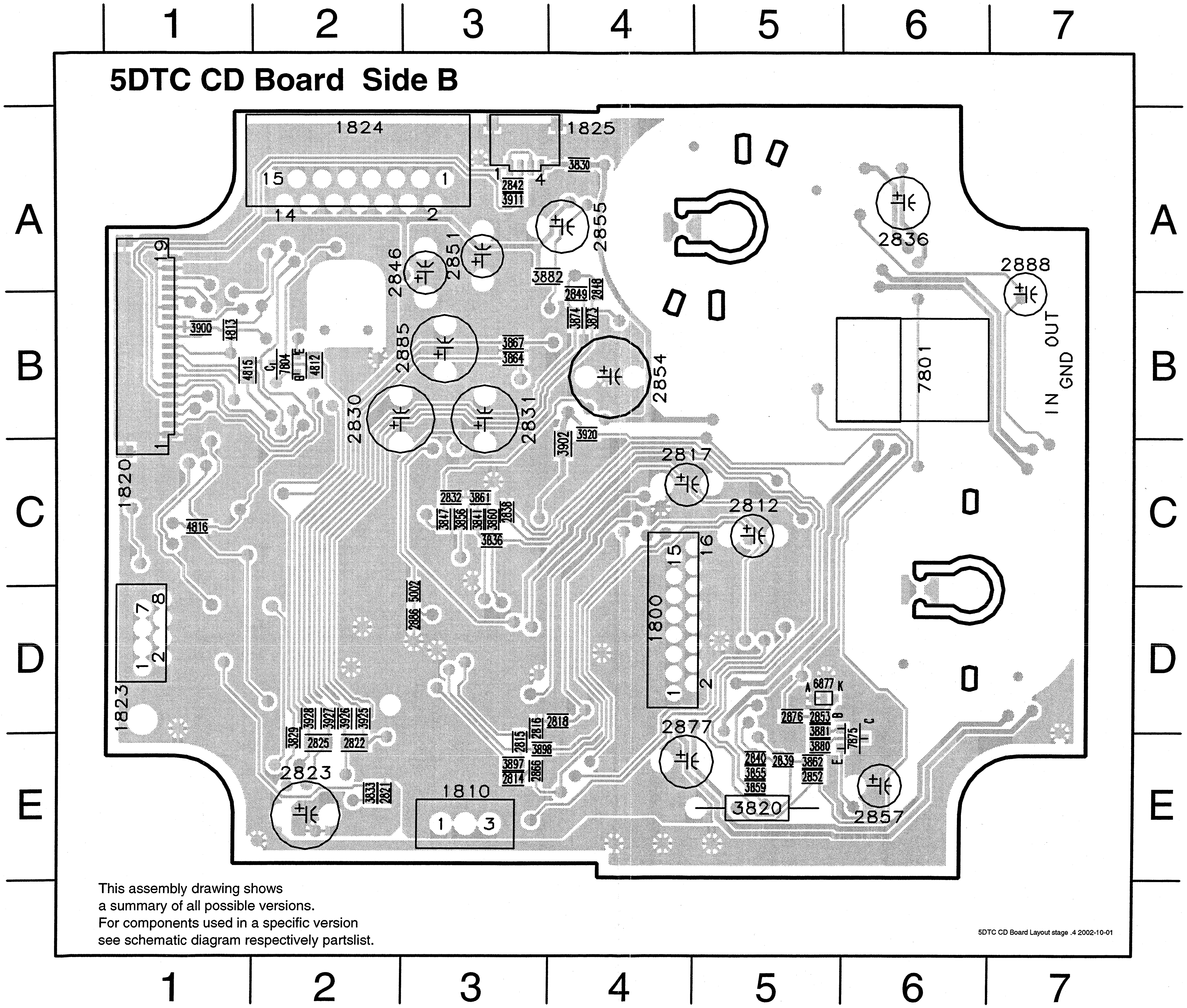
This assembly drawing shows
a summary of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

5DTC CD Board Layout stage .5 20040616

MAPPING FOR COMPONENT LAYOUT

1800	D3	3851	C5
1810	E5	3852	B3
1823	D7	3853	B6
1824	A5	3854	B2
2811	B6	3857	C1
2812	C3	3865	A4
2813	C4	3866	D3
2817	C3	3868	A4
2819	E5	3869	B5
2820	E5	3870	A5
2823	E6	3871	B5
2824	B1	3872	E3
2826	B5	3875	A4
2827	C6	3876	B4
2828	C6	3877	A5
2829	C2	3878	D6
2830	B5	3879	A5
2831	B5	3883	A4
2833	B2	3884	A4
2834	C5	3887	B6
2835	B3	3888	C6
2836	A2	3889	E6
2837	A2	3890	E6
2841	E2	3891	C3
2843	B4	3892	C3
2844	B4	3893	C3
2845	B4	3894	C3
2846	A5	3895	D4
2847	B1	3896	C3
2850	B4	3899	C4
2851	A5	3901	C4
2854	B4	3903	C4
2855	A4	3904	C4
2857	E2	3905	B3
2860	C3	3906	C4
2861	D4	3907	D4
2863	D3	3908	C4
2864	D3	3909	C4
2865	D4	3910	C6
2869	D4	3912	A4
2870	E5	3916	C6
2871	E5	3917	B5
2872	E4	3918	A2
2873	E4	3919	B2
2874	D4	3922	C4
2875	E4	3923	B4
2877	D3	4804	A4
2878	D2	4807	A4
2879	E2	4809	C7
2880	E2	4810	C7
2881	D4	4811	C6
2882	C4	4814	C6
2883	C4	4820	C2
2884	C4	4821	C2
2885	B5	4822	C2
2887	D4	4824	C2
2888	A1	4835	D2
3801	C3	4836	A5
3802	D4	4837	B5
3803	C4	4838	C6
3804	D3	4840	A2
3805	C3	4841	B6
3806	D4	4843	D2
3807	E4	5001	B3
3808	E4	7800	C6
3809	E4	7801	B1
3810	E4	7802	B2
3811	E4	7810	B4
3812	D4	7811	D2
3813	C4	7876	C4
3814	D3	7877	C4
3815	D3	7878	C4
3816	D4	7879	E4
3817	E3		
3818	E3		
3819	E3		
3820	E3		
3821	E3		
3822	D2		
3823	D2		
3824	E2		
3825	D2		
3826	D2		
3827	D2		
3828	D2		
3831	D6		
3832	C6		
3834	D6		
3835	D6		
3837	C6		
3838	C5		
3839	C6		
3840	A5		
3842	B3		
3843	C2		
3844	B5		
3845	C6		
3846	B1		
3848	B4		
3849	C6		
3850	B2		

5DTC CD Board Side B


1
2
3
4
5
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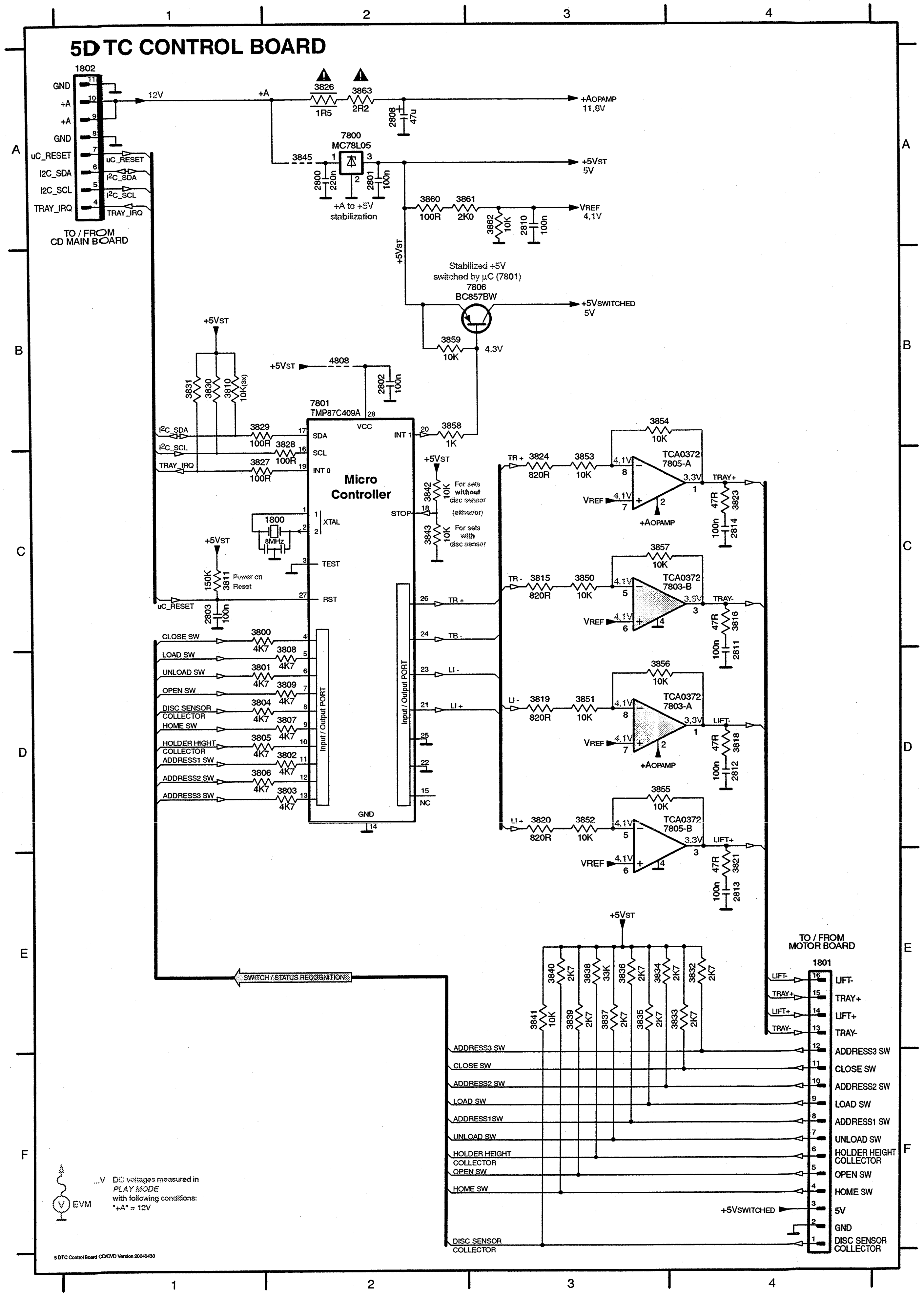
7
A
B
C
D
E
1824
15
1
14
2
1825
1
4
3830
2842
3911
2855
2836
2888
2851
2846
3882
2849
2848
3874
3873
19
1
1820
3900
4813
4815
7804
C
B
E
4812
2885
3867
3864
2854
7801
IN
GND
OUT
2830
2831
3902
3920
2817
2812
2832
3861
3847
3856
3841
3860
2838
3836
4816
1800
16
15
2
1
8
7
2
1
1823
5002
2886
6877
A
K
2876
2853
B
C
3881
3880
7875
E
3928
3927
3926
3925
3829
2825
2822
2816
2818
2815
3898
3897
2814
2866
2877
2840
3855
3859
2839
3862
2852
2857
2823
3833
2821
1810
1
3
3820

This assembly drawing shows
a summary of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

5DTC CD Board Layout stage .4 2002-10-01

1800	D5
1810	E3
1820	C1
1823	D1
1824	A3
1825	A4
2812	C5
2814	E4
2815	E4
2816	D4
2817	C5
2818	D4
2821	E3
2822	E3
2823	E2
2825	E2
2830	B2
2831	B4
2832	C3
2836	A6
2838	C4
2839	E5
2840	E5
2842	A4
2846	A3
2848	A4
2849	B4
2851	A3
2852	E6
2853	D6
2854	B5
2855	A4
2857	E6
2866	E4
2876	D5
2877	D5
2885	B3
2886	D3
2888	A7
3820	E5
3829	E2
3830	A4
3833	E3
3836	C3
3841	C3
3847	C3
3855	E5
3856	C3
3859	E5
3860	C3
3861	C3
3862	E6
3864	B4
3867	B4
3873	B4
3874	B4
3880	E6
3881	D6
3882	A4
3897	E4
3898	E4
3900	B1
3902	C4
3911	A4
3920	B4
3925	D3
3926	D2
3927	D2
3928	D2
4812	B2
4813	B2
4815	B2
4816	C1
5002	D3
6877	D6
7801	B6
7804	B2
7875	E6

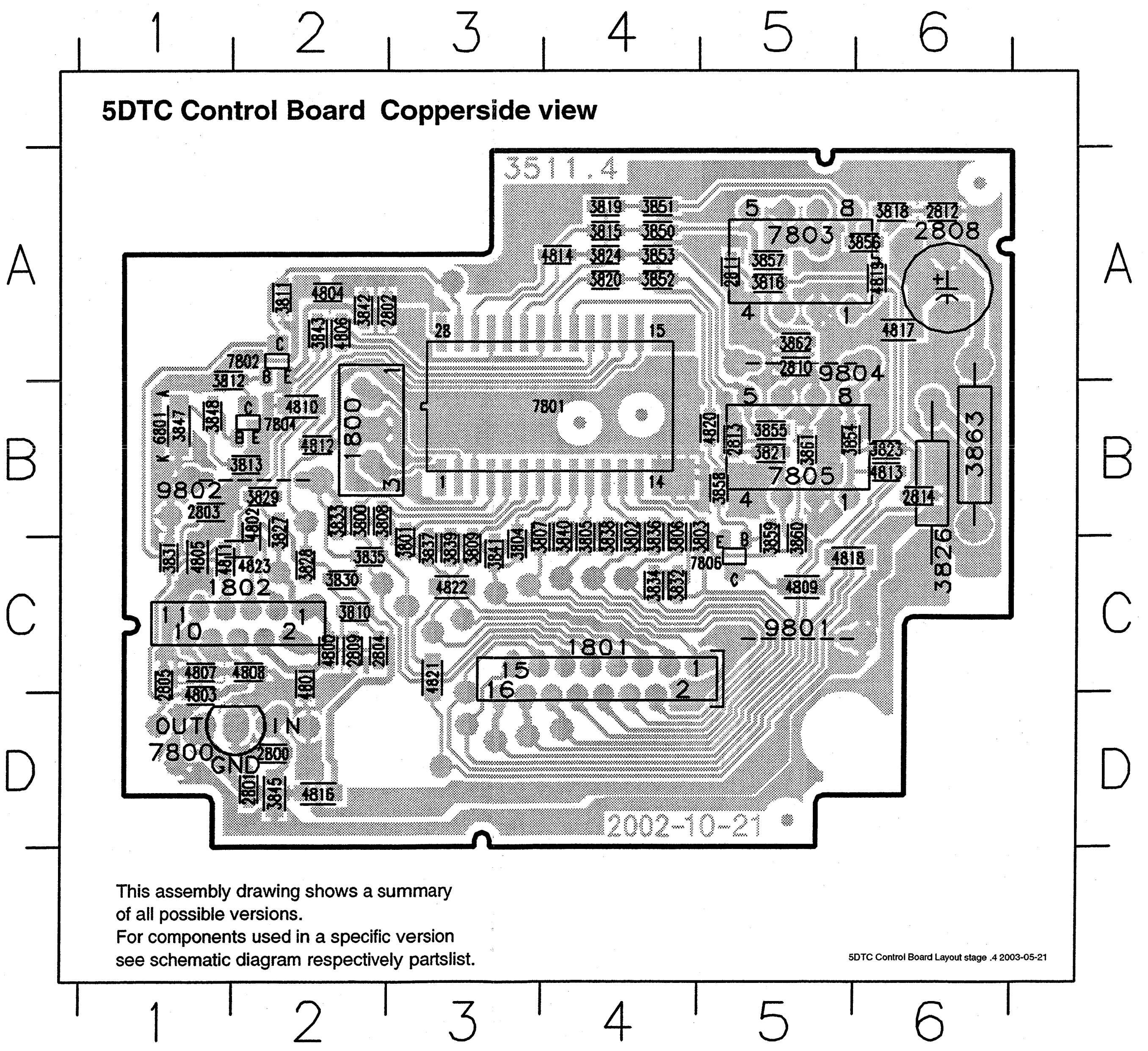

5D TC CONTROL BOARD
1802
GND
+A
+A
GND
uC_RESET
I2C_SDA
I2C_SCL
TRAY_IRQ
TO / FROM CD MAIN BOARD
12V
+A
3826 1R5
3863 2R2
2808 47u
+AOPAMP 11,6V
7800 MC78L05
3845
2800 220n
2801 100n
+A to +5V stabilization
+5VST 5V
3860 100R
3861 2K0
3862 10K
2810 100n
VREF 4,1V
Stabilized +5V switched by µC (7801)
7806 BC857BW
+5VSWITCHED 5V
3859 10K
4,3V
+5VST
3831
3830
3810 10K(3x)
4808
2802 100n
7801 TMP87C409A
VCC
SDA
SCL
INT 0
INT 1
3829 100R
3828 100R
3827 100R
3858 1K
Micro Controller
1800 8MHz
XTAL
TEST
RST
STOP
3842 10K For sets without disc sensor (either/or)
3843 10K For sets with disc sensor
150K 3811 Power on Reset
2803 100n
CLOSE SW
LOAD SW
UNLOAD SW
OPEN SW
DISC SENSOR COLLECTOR
HOME SW
HOLDER HIGHT COLLECTOR
ADDRESS1 SW
ADDRESS2 SW
ADDRESS3 SW
3800 4K7
3808 4K7
3801 4K7
3809 4K7
3804 4K7
3807 4K7
3805 4K7
3802 4K7
3806 4K7
3803 4K7
Input / Output PORT
Input / Output PORT
GND
NC
TR+
TR-
LI-
LI+
TR+ 3824 820R
3853 10K
3854 10K
TCA0372 7805-A
TRAY+
47R 3823
100n 2814
TR- 3815 820R
3850 10K
3857 10K
TCA0372 7803-B
TRAY-
47R 3816
100n 2811
LI- 3819 820R
3851 10K
3856 10K
TCA0372 7803-A
LIFT-
47R 3818
100n 2812
LI+ 3820 820R
3852 10K
3855 10K
TCA0372 7805-B
LIFT+
47R 3821
100n 2813
VREF
+AOPAMP
4,1V
3,3V
+5VST
3840 2K7
3838 33K
3836 2K7
3834 2K7
3832 2K7
3841 10K
3839 2K7
3837 2K7
3835 2K7
3833 2K7
SWITCH / STATUS RECOGNITION
TO / FROM MOTOR BOARD
1801
LIFT-
TRAY+
LIFT+
TRAY-
ADDRESS3 SW
CLOSE SW
ADDRESS2 SW
LOAD SW
ADDRESS1 SW
UNLOAD SW
HOLDER HEIGHT COLLECTOR
OPEN SW
HOME SW
5V
GND
DISC SENSOR COLLECTOR
+5VSWITCHED
...V DC voltages measured in PLAY MODE with following conditions: "+A" = 12V
EVM
5 DTC Control Board CD/DVD Version 20040430

MAPPING FOR CIRCUIT DIAGRAM

1800	C2	2810	A3	3804	D1	3811	C1	3824	C3	3833	E4	3841	E3	3854	B3	3862	A3	7805-B	D3
1801	E4	2811	D4	3805	D1	3815	C3	3826	A2	3834	E3	3842	C2	3855	D3	3863	A2	7806	B3
1802	A1	2812	D4	3806	D1	3816	C4	3827	C1	3835	E3	3843	C2	3856	D3	4808	B2		
2800	A2	2813	E4	3807	D2	3818	D4	3828	C2	3836	E3	3845	A2	3857	C3	7800	A2		
2801	A2	2814	C4	3808	D1	3819	D3	3829	B1	3837	E3	3850	C3	3858	B2	7801	B2		
2802	B2	3800	C1	3808	D2	3820	D3	3830	B1	3838	E3	3851	D3	3859	B3	7803-A	D3		
2803	C1	3802	D2	3809	D2	3821	E4	3831	B1	3839	E3	3852	D3	3860	A2	7803-B	C3		
2808	A2	3803	D2	3810	B1	3823	C4	3832	E4	3840	E3	3853	C3	3861	A2	7805-A	C3		

MAPPING FOR COMPONENT LAYOUT

1800	B2	2810	A5	3806	C4	3819	A4	3832	C4	3843	A2	3857	A5	4804	A2	4816	D2	7802	A2
1801	C4	2811	A5	3807	C3	3820	A4	3833	B2	3845	D2	3858	B5	4805	C1	4817	A6	7803	A5
1802	C2	2812	A6	3808	B2	3821	B5	3834	C4	3847	B1	3859	C5	4806	A2	4818	C5	7804	B2
2800	D2	2813	B5	3809	C3	3823	B6	3835	C2	3848	B1	3860	C5	4807	C1	4819	A6	7806	C5
2801	D2	2814	B6	3810	C2	3824	A4	3836	C4	3850	A4	3861	B5	4808	C2	4820	B5	9801	C5
2802	A2	3800	B2	3811	A2	3826	B6	3837	C3	3851	A4	3862	A5	4809	C5	4821	C3	9802	B2
2803	B1	3801	C3	3812	A1	3827	B2	3838	C4	3852	A4	3863	B6	4810	B2	4822	C3	9804	A5
2804	C2	3802	C4	3813	B2	3828	C2	3839	C3	3853	A4	4800	C2	4811	C1	4823	B1		
2805	C1	3803	C4	3815	A4	3829	B2	3840	C4	3854	B5	4801	C2	4812	B2	6801	B1		
2808	A6	3804	C3	3816	A5	3830	C2	3841	C3	3855	B5	4802	C2	4813	B6	7800	D2		
2809	C2	3805	C4	3818	A6	3831	C1	3842	A2	3856	A6	4803	D1	4814	A4	7801	B4		

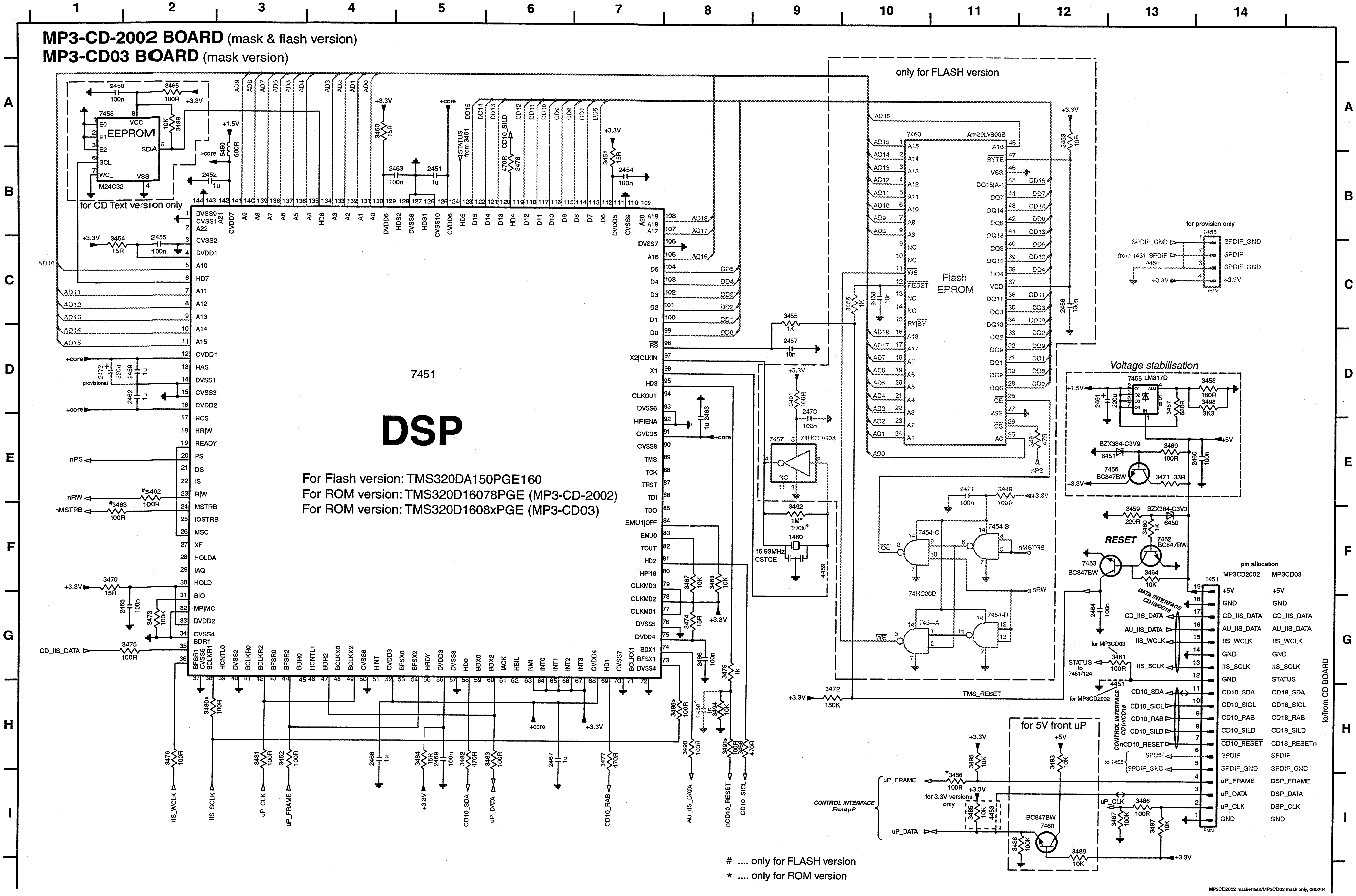

5DTC Control Board Copperside view
1
2
3
4
5
6
A
B
C
D
3511.4
7803
7805
7801
7800
1802
1801
9801
9802
9804
2808
3863
3826
OUT
IN
GND
2002-10-21

This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

5DTC Control Board Layout stage .4 2003-05-21

MP3 BOARD - CIRCUIT DIAGRAM

FOR ORIENTATION ONLY



MP3-CD-2002 BOARD (mask & flash version)

MP3-CD03 BOARD (mask version)

1
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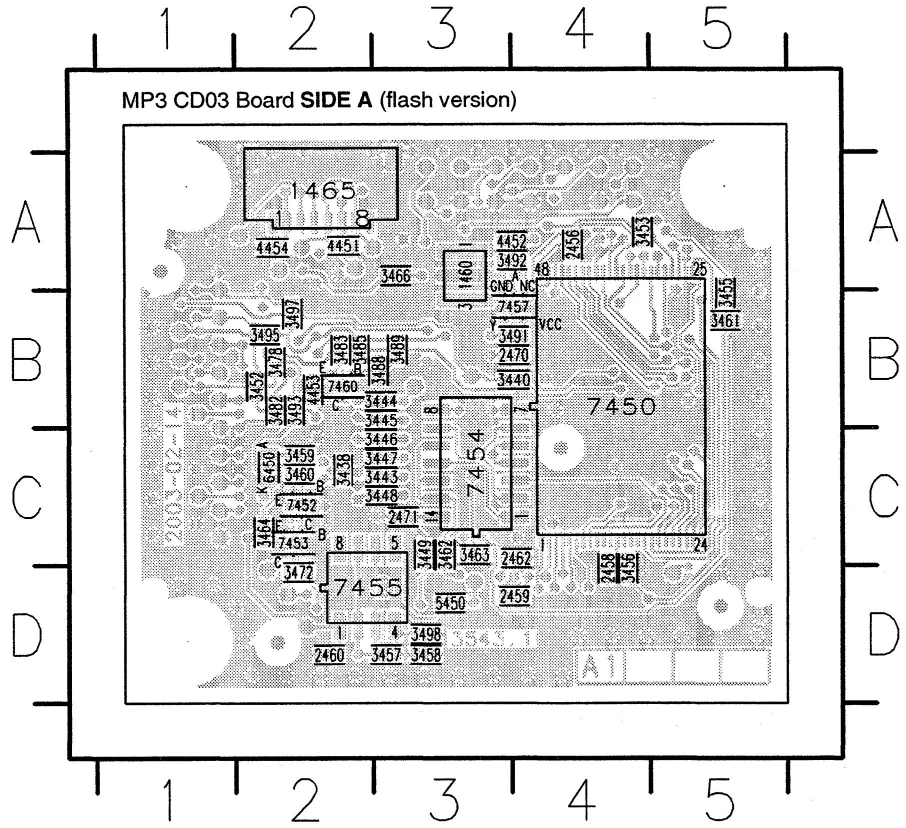
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
7458
EEPROM
M24C32
for CD Text version only
only for FLASH version
7450
Am29LV800B
Flash EPROM
7451
DSP
For Flash version: TMS320DA150PGE160
For ROM version: TMS320D16078PGE (MP3-CD-2002)
For ROM version: TMS320D1608xPGE (MP3-CD03)
7457
74HCT1G04
1460
16.93MHz
CSTCE
74HC00D
7454-A
7454-B
7454-C
7454-D
TMS_RESET
Voltage stabilisation
7455 LM317D
BZX384-C3V9
7456
BC847BW
RESET
7452
BC847BW
7453
BC847BW
BZX384-C3V3
for provision only
1455
SPDIF_GND
SPDIF
from 1451 SPDIF
4450
pin allocation
MP3CD2002
MP3CD03
1451
+5V
GND
CD_IIS_DATA
AU_IIS_DATA
IIS_WCLK
IIS_SCLK
STATUS
CD10_SDA
CD10_SICL
CD10_RAB
CD10_SILD
CD10_RESET
CD18_SDA
CD18_SICL
CD18_RAB
CD18_SILD
CD18_RESETn
SPDIF_GND
uP_FRAME
uP_DATA
uP_CLK
DSP_FRAME
DSP_DATA
DSP_CLK
to/from CD BOARD
DATA INTERFACE CD10/CD18
CONTROL INTERFACE CD10/CD18
CONTROL INTERFACE Front µP
for 5V front uP
BC847BW
7460
for 3.3V versions only
IIS_WCLK
IIS_SCLK
uP_CLK
uP_FRAME
CD10_SDA
uP_DATA
CD10_RAB
AU_IIS_DATA
nCD10_RESET
CD10_SICL
nPS
nRW
nMSTRB
CD_IIS_DATA
+3.3V
+1.5V
+core
+5V
MP3CD2002 mask+flash/MP3CD03 mask only, 060204

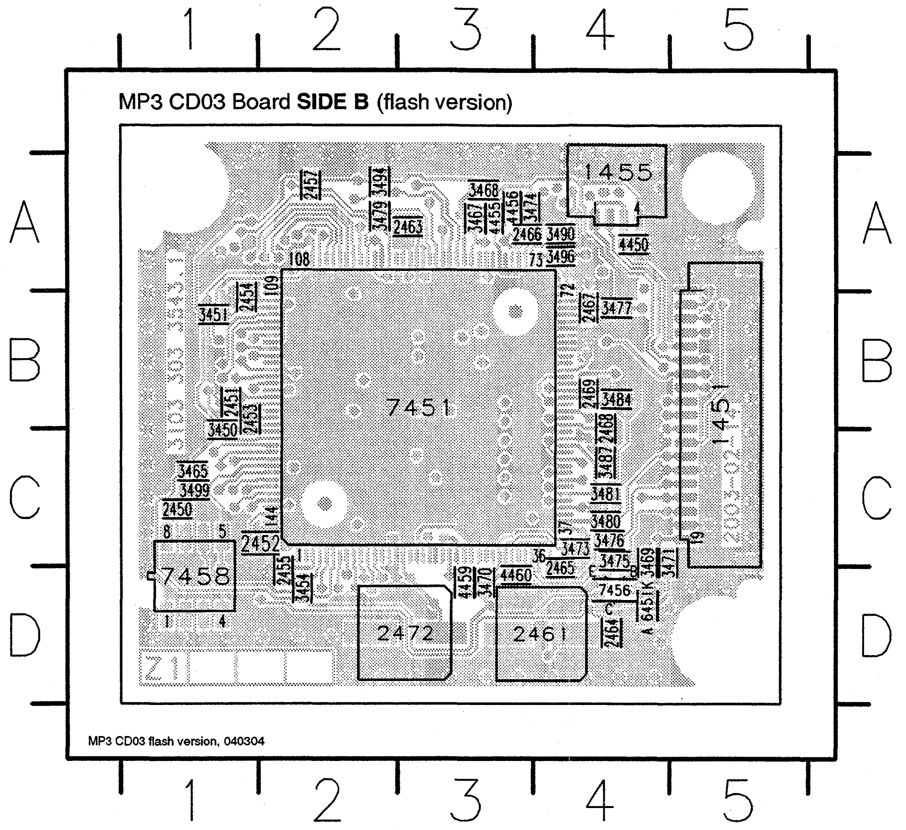
.... only for FLASH version

* .... only for ROM version

MP3 BOARD FOR ORIENTATION ONLY


MP3 CD03 Board **SIDE A** (flash version)

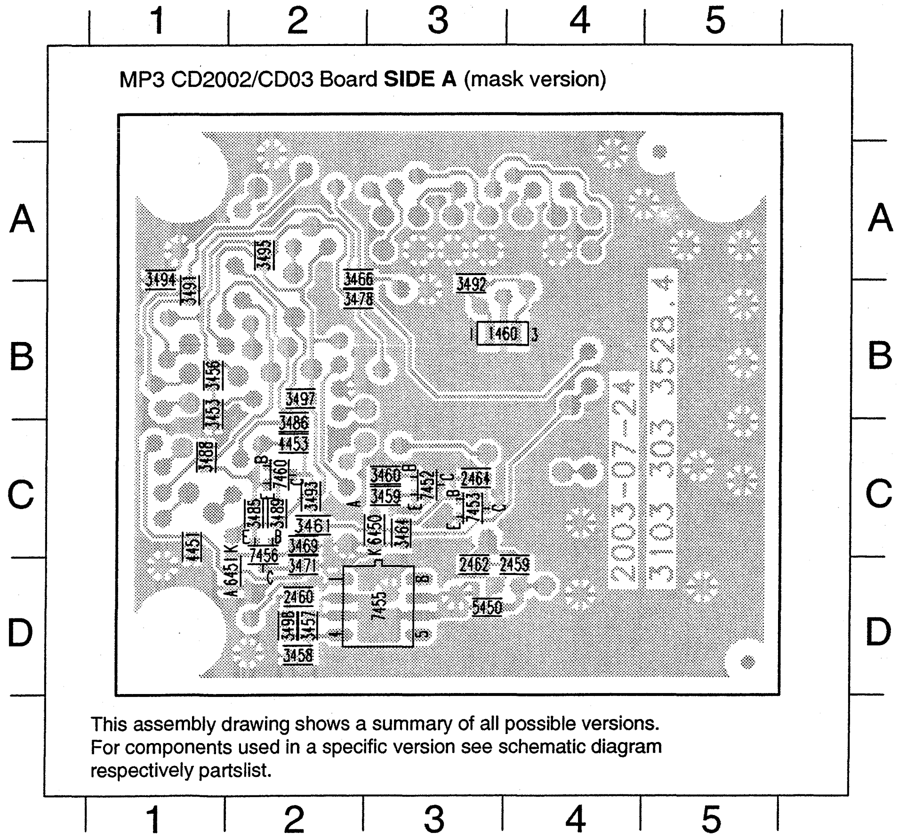
1460	A3
1465	A2
2456	A4
2458	D4
2459	D4
2460	D2
2462	C4
2470	B4
2471	C3
3438	C2
3440	B4
3443	C3
3444	B3
3445	B3
3446	C3
3447	C3
3448	C3
3449	C3
3452	B2
3453	A4
3455	B5
3456	D4
3457	D3
3458	D3
3459	C2
3460	C2
3461	B5
3462	C3
3463	C3
3464	C2
3466	A3
3472	D2
3478	B2
3482	B2
3483	B2
3485	B2
3488	B3
3489	B3
3491	B4
3492	A3
3493	B2
3495	B2
3497	B2
3498	D3
4451	A2
4452	A3
4453	B2
4454	A2
5450	D3
6450	C2
7450	B4
7452	C2
7453	C2
7454	C3
7455	D2
7457	B4
7460	B2


MP3 CD03 Board **SIDE B** (flash version)

MP3 CD03 flash version, 040304

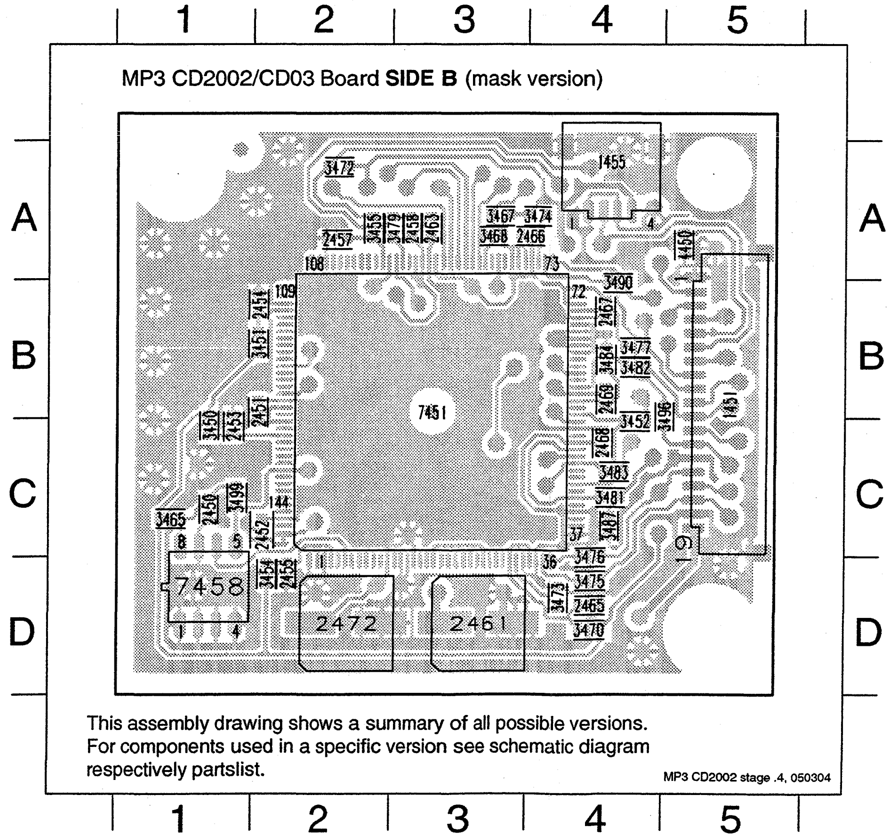
1451	B5
1455	A4
2450	C1
2451	B1
2452	C2
2453	B1
2454	B1
2455	D2
2457	A2
2461	D4
2463	A3
2464	D4
2465	D4
2466	A3
2467	B4
2468	B4
2469	B4
2472	D3
3450	C1
3451	B1
3454	D2
3465	C1
3467	A3
3468	A3
3469	C4
3470	D3
3471	C4
3473	C4
3474	A3
3475	C4
3476	C4
3477	B4
3479	A2
3480	C4
3481	C4
3484	B4
3487	C4
3490	A4
3494	A2
3496	A4
3499	C1
4450	A4
4455	A3
4456	A3
4459	D3
4460	D3
6451	D4
7451	B3
7456	D4
7458	D1

1460	B3	3456	B1	3464	C3	3486	C2	3494	A1	5450	D3	7456	C2
2459	D4	3457	D2	3466	A2	3488	C1	3495	A2	6450	C3	7460	C2
2460	D2	3458	D2	3469	C2	3489	C2	3497	B2	6451	D2		
2462	D3	3459	C3	3471	D2	3491	B1	3498	D2	7452	C3		
2464	C3	3460	C3	3478	B2	3492	B3	4451	C1	7453	C3		
3453	B1	3461	C2	3485	C2	3493	C2	4453	C2	7455	D3		


MP3 CD2002/CD03 Board **SIDE A** (mask version)

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

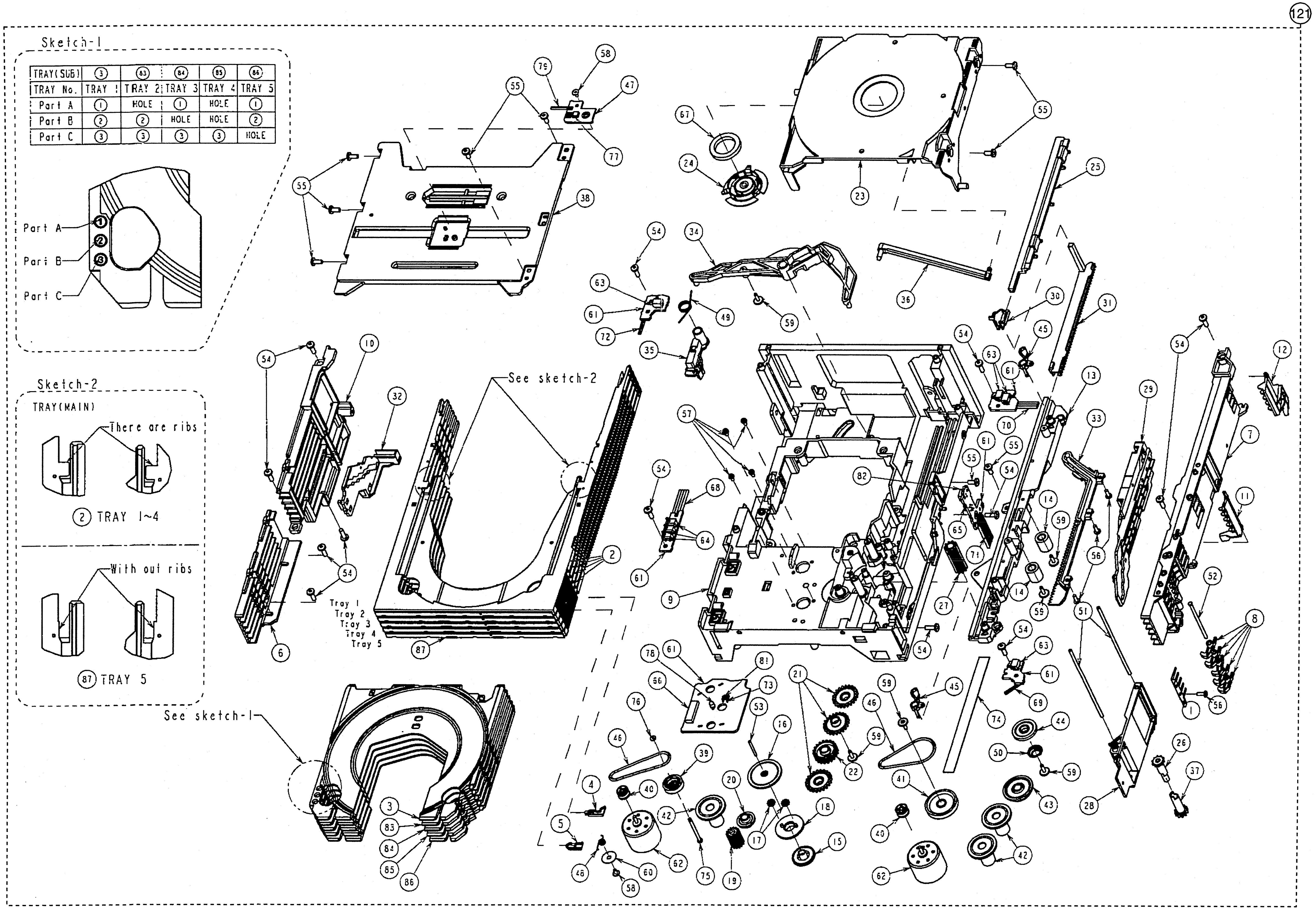
1451	B5	2454	B2	2465	D4	3450	C1	3467	A3	3475	D4	3483	C4	4450	A5
1455	A4	2455	D2	2466	A4	3451	B2	3468	A3	3476	D4	3484	B4	7451	B3
2450	C1	2457	A2	2467	B4	3452	C4	3470	D4	3477	B4	3487	C4	7458	D1
2451	B2	2458	A3	2468	C4	3454	D2	3472	A2	3479	A2	3490	B4		
2452	C2	2461	D3	2469	B4	3455	A2	3473	D4	3481	C4	3496	B4		
2453	C1	2463	A3	2472	D2	3465	C1	3474	A4	3482	B4	3499	C1		


MP3 CD2002/CD03 Board **SIDE B** (mask version)

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

MP3 CD2002 stage .4, 050304

Exploded view 5DTC mechanic - for orientation only



TRAY(SUB)	③	(63)	(84)	(85)	(86)
TRAY No.	TRAY 1	TRAY 2	TRAY 3	TRAY 4	TRAY 5
Part A	①	HOLE	①	HOLE	①
Part B	②	②	HOLE	HOLE	②
Part C	③	③	③	③	HOLE

(121)
Sketch-1
Part A
Part B
Part C
Sketch-2
TRAY(MAIN)
There are ribs
② TRAY 1~4
With out ribs
(87) TRAY 5
See sketch-1
See sketch-2
Tray 1
Tray 2
Tray 3
Tray 4
Tray 5

PARTSLIST 5DTC MODULE MP3CD Version

MECHANICAL PARTS

121	**3103**	**308 54710**	**5DTC Module** (mechanic w/o electronic)
201	3103	309 05390	CD DRIVE DA12T3
252	4822	529 10387	Rubber damper CD DRIVE, FRONT
253	4822	529 10386	Rubber damper CD DRIVE, REAR

MISCELLANEOUS

1001	**3103**	**308 66981**	**CD BOARD (complete assy)**
1021	**3103**	**308 66951**	**CONTROL BOARD (complete assy)**
1051	**3103**	**308 67031**	**MP3 BOARD (complete assy)**
1800	4822	267 11028	FFC-CONNECTOR 16P, Side entry
1820	2422	025 17303	FFC-CONNECTOR 19P, Side entry
1823	2422	025 16371	FFC-CONNECTOR 8P, Side entry
1824	4822	265 10979	FFC-CONNECTOR, 15P, Side entry
8001	3103	308 93090	FFC CABLE 16Pin 80mm BD
8051	3103	308 93100	FFC-CABLE 19Pin 90mm AD
8052	3103	308 93120	FFC CABLE 8Pin 80mm BD

ELECTRICAL PARTSLIST CD BOARD MP3CD Version

MISCELLANEOUS

1001	**3103**	**308 66981**	**CD BOARD (complete assy)**

CAPACITORS

2812	4822 124 11947	10µF	20%	16V
2813©	4822 126 13193	4,7nF	10%	63V
2814©	5322 126 11579	3,3nF	10%	63V
2815©	2020 552 94427	100pF	5%	50V
2816©	3198 017 42230	22nF	10%	50V
2817	4822 124 22726	4,7µF	20%	35V
2818©	3198 024 44730	47nF	5%	50V
2821©	2238 586 59812	100nF	10%	50V
2822©	4822 126 13344	1,5nF	5%	63V
2823	4822 124 42383	220µF	20%	4V
2824©	4822 126 14043	1µF	20%	16V
2825©	4822 126 13344	1,5nF	5%	63V
2826©	3198 017 34730	47nF	10%	16V
2827©	5322 126 11578	1nF	10%	63V
2828©	4822 126 11669	27pF	10%	50V
2829©	3198 017 34730	47nF	10%	16V
2830	4822 124 81286	47µF	20%	16V
2831	4822 124 81286	47µF	20%	16V
2832©	3198 017 31530	15nF	10%	50V
2833©	5322 126 11583	10nF	10%	63V
2834©	3198 017 31530	15nF	10%	50V
2835©	5322 126 11583	10nF	10%	63V
2836	4822 124 40433	47µF	20%	25V
2837©	3198 017 34730	47nF	10%	16V
2838©	3198 017 44740	470nF	20%	10V
2839©	2238 586 59812	100nF	10%	50V
2840©	4822 126 14549	33nF	10%	16V
2841©	2238 586 59812	100nF	10%	50V
2843©	2020 552 94427	100pF	5%	50V
2844©	5322 122 33861	120pF	5%	NP0
2845©	5322 122 33861	120pF	5%	NP0
2846	4822 124 40248	10µF	20%	63V
2847©	3198 017 41050	1µF	20%	10V
2848©	2020 552 94427	100pF	5%	50V
2849©	5322 122 33861	120pF	5%	NP0
2850©	5322 122 33861	120pF	5%	NP0
2851	4822 124 40248	10µF	20%	63V
2852©	4822 126 14549	33nF	10%	16V
2853©	5322 126 11583	10nF	10%	63V
2854	4822 124 12245	220µF	20%	16V

ELECTRICAL PARTSLIST CD BOARD MP3CD Version

CAPACITORS

2855	4822 124 11912	220µF	20%	6,3V
2860©	4822 122 33753	150pF	5%	50
2861©	4822 122 33753	150pF	5%	50V
2863©	4822 126 14508	180pF	5%	50V
2864©	4822 126 14508	180pF	5%	50V
2865©	4822 126 14508	180pF	5%	50V
2866©	4822 126 14508	180pF	5%	50V
2869©	3198 017 34730	47nF	10%	16V
2870©	4822 126 13883	220pF	5%	50V
2871©	4822 126 13883	220pF	5%	50V
2872©	4822 126 13883	220pF	5%	50V
2873©	4822 126 13883	220pF	5%	50V
2874©	4822 126 13883	220pF	5%	50V
2875©	4822 126 13883	220pF	5%	50V
2876©	3198 017 44740	470nF	20%	10V
2877	4822 124 40433	47µF	20%	25V
2878©	2238 586 59812	100nF	10%	50V
2879©	5322 126 11578	1nF	10%	63V
2880©	2222 867 15339	33pF	5%	50V
2881©	4822 126 14249	560pF	10%	50V
2882©	4822 126 14226	82pF		50V
2883©	3198 017 44740	470nF	20%	10V
2884©	3198 017 44740	470nF	20%	10V
2885	4822 124 40196	220µF	20%	16V
2886©	2238 586 59812	100nF	10%	50V
2887©	3198 017 34730	47nF	10%	16V

RESISTORS

3801©	4822 051 30393	39kΩ	5%	0,06W
3802©	4822 051 30393	39kΩ	5%	0,06W
3803©	4822 117 12925	47kΩ	1%	0,06W
3804©	4822 117 12925	47kΩ	1%	0,06W
3805©	4822 117 12925	47kΩ	1%	0,06W
3806©	4822 117 12925	47kΩ	1%	0,06W
3807©	4822 051 30103	10kΩ	5%	0,06W
3808©	4822 051 30103	10kΩ	5%	0,06W
3809©	4822 051 30103	10kΩ	5%	0,06W
3810©	4822 051 30103	10kΩ	5%	0,06W
3811©	4822 051 30103	10kΩ	5%	0,06W
3812©	4822 051 30103	10kΩ	5%	0,06W
3813©	4822 051 30222	2,2kΩ	5%	0,06W
3814©	4822 051 30222	2,2kΩ	5%	0,06W
3815©	4822 051 30222	2,2kΩ	5%	0,06W
3816©	4822 051 30222	2,2kΩ	5%	0,06W
3817©	4822 051 30479	47Ω	5%	0,06W
3818©	4822 051 30479	47Ω	5%	0,06W
3819©	4822 051 30479	47Ω	5%	0,06W
3820 ▲	**4822 052 10478**	**4,7Ω**	**5%**	**NFR25**
3821©	4822 117 12917	1Ω	5%	0,06W
3822©	4822 051 30103	10kΩ	5%	0,06W
3823©	4822 051 30102	1kΩ	5%	0,06W
3824©	4822 051 30474	470kΩ	5%	0,06W
3825©	5322 117 13029	47kΩ	1%	0,06W
3826©	4822 117 12891	220kΩ	1%	0,06W
3827©	5322 117 13056	8,2kΩ	1%	0,06W
3828©	5322 117 13052	2,7kΩ	1%	0.06W
3829©	4822 051 30121	120Ω	5%	0,06W
3831©	4822 051 30471	470Ω	5%	0,06W
3832©	4822 051 30471	470Ω	5%	0,06W
3833©	4822 051 30121	120Ω	5%	0,06W
3834©	4822 051 30472	4,7kΩ	5%	0,06W
3836©	4822 117 13632	100kΩ	1%	0,06W
3837©	4822 051 30471	470Ω	5%	0,06W

ELECTRICAL PARTSLIST 5DTC MODULE CD BOARD MP3CD Version

RESISTORS

3839©	4822 051 30471	470Ω	5%	0,06W
3840©	4822 051 30223	22kΩ	5%	0,06W
3841©	4822 051 30153	15kΩ	5%	0,06W
3842©	4822 051 30102	1kΩ	5%	0,06W
3843©	4822 051 30102	1kΩ	5%	0,06W
3844©	4822 051 30101	100Ω	5%	0,06W
3845©	4822 051 30471	470Ω	5%	0,06W
3846©	4822 051 30102	1kΩ	5%	0,06W
3847©	4822 117 12968	820Ω	5%	0,06W
3848©	4822 051 30221	220Ω	5%	0,06W
3849©	4822 051 30471	470Ω	5%	0,06W
3850©	4822 117 12925	47kΩ	1%	0,06W
3851©	4822 117 12968	820Ω	5%	0,06W
3852©	4822 051 30221	220Ω	5%	0,06W
3854©	4822 117 12925	47kΩ	1%	0,06W
3855©	4822 051 30393	39kΩ	5%	0,06W
3856©	4822 051 30272	2,7kΩ	5%	0,06W
3857©	4822 051 30008	CHIP JUMPER 0603		
3859©	4822 117 13632	100kΩ	1%	0,06W
3860©	4822 051 30123	12kΩ	5%	0,06W
3861©	4822 051 30153	15kΩ	5%	0,06W
3862©	4822 051 30393	39kΩ	5%	0,06W
3864©	4822 051 30333	33kΩ	5%	0,06W
3865©	4822 051 30181	180Ω	5%	0,06W
3866©	4822 117 13608	4,7Ω	5%	0,06W
3867©	4822 051 30333	33kΩ	5%	0,06W
3868©	4822 051 30183	18kΩ	5%	0,06W
3869©	4822 051 30183	18kΩ	5%	0,06W
3870©	4822 051 30681	680Ω	5%	0,06W
3871©	4822 051 30181	180Ω	5%	0,06W
3872©	4822 051 30272	2,7kΩ	5%	0,06W
3873©	4822 051 30333	33kΩ	5%	0,06W
3874©	4822 051 30333	33kΩ	5%	0,06W
3875©	4822 051 30183	18kΩ	5%	0,06W
3876©	4822 051 30183	18kΩ	5%	0,06W
3877©	4822 051 30681	680Ω	5%	0,06W
3878©	4822 051 30471	470Ω	5%	0,06W
3879©	4822 051 30223	22kΩ	5%	0,06W
3880©	4822 051 30339	33Ω	5%	0,06W
3881©	4822 051 30151	150Ω	5%	0,06W
3883©	4822 051 30472	4,7kΩ	5%	0,06W
3884©	4822 051 30472	4,7kΩ	5%	0,06W
3888©	4822 051 30103	10kΩ	5%	0,06W
3889©	4822 051 30471	470Ω	5%	0,06W
3890©	4822 051 30471	470Ω	5%	0,06W
3891©	4822 051 30102	1kΩ	5%	0,06W
3892©	4822 051 30102	1kΩ	5%	0,06W
3893©	4822 051 30471	470Ω	5%	0,06W
3895©	4822 051 30273	27kΩ	5%	0,06W
3896©	4822 051 30101	100Ω	5%	0,06W
3897©	4822 051 30333	33kΩ	5%	0,06W
3898©	4822 051 30221	220Ω	5%	0,06W
3899©	4822 051 30272	2,7kΩ	5%	0,06W
3901©	4822 051 30561	560Ω	5%	0,06W
3902©	4822 117 11139	1,5kΩ	1%	0,1W
3903©	4822 051 30332	3,3kΩ	5%	0,06W
3904©	4822 051 30332	3,3kΩ	5%	0,06W
3905©	4822 051 30681	680Ω	5%	0,06W
3906©	4822 051 30471	470Ω	5%	0,06W
3907©	4822 117 12968	820Ω	5%	0,06W
3908©	4822 051 30222	2,2kΩ	5%	0,06W
3909©	4822 117 13632	100kΩ	1%	0,06W
3910©	4822 051 30471	470Ω	5%	0,06W

RESISTORS

3912©	4822 051 30221	220Ω	5%	0,06W
3916©	4822 051 30471	470Ω	5%	0,06W
3917©	4822 117 13608	4,7Ω	5%	0,06W
3918©	4822 051 30103	10kΩ	5%	0,06W
3919©	4822 051 30153	15kΩ	5%	0,06W
3920©	4822 051 30101	100Ω	5%	0,06W
3923©	4822 051 30103	10kΩ	5%	0,06W
3925©	4822 051 30101	100Ω	5%	0,06W
3926©	4822 051 30101	100Ω	5%	0,06W
3927©	4822 051 30101	100Ω	5%	0,06W
3928©	4822 051 30101	100Ω	5%	0,06W
4807©	4822 051 30008	CHIP JUMPER 0603		
4809©	4822 051 30008	CHIP JUMPER 0603		
4820©	4822 051 30008	CHIP JUMPER 0603		
4824©	4822 051 30008	CHIP JUMPER 0603		
4835©	4822 051 20008	CHIP JUMPER 0805		
4836©	4822 051 20008	CHIP JUMPER 0805		
4837©	4822 051 20008	CHIP JUMPER 0805		
4838©	4822 051 20008	CHIP JUMPER 0805		
4840©	4822 051 20008	CHIP JUMPER 0805		
4841©	4822 051 20008	CHIP JUMPER 0805		
4843©	4822 051 20008	CHIP JUMPER 0805		

COILS

1810	2422 540 98519	RESONATOR 8,467MHz
5001©	2422 549 44607	FERRITE BEAD
5002©	2422 549 44607	FERRITE BEAD

DIODES

6877©	9322 129 34685	BZX284-C3V9

TRANSISTORS

7875©	5322 130 42755	BC847C
7876©	5322 130 42755	BC847C
7877©	5322 130 42755	BC847C
7878©	5322 130 42755	BC847C
7879©	5322 130 60123	BC807-40

INTEGRATED CIRCUITS

7800©	9352 684 20557	SAA7325H/T/M2B, Signal Processor
7801	4822 209 72554	MC7808CT 8V Regulator
7802©	9322 181 79668	MM1469PH Motor Driver
7810©	5322 209 82941	LM358D, Dual Opamp
7811©	5322 209 82941	LM358D, Dual Opamp

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.

ELECTRICAL PARTSLIST 5DTC MODULE CONTROL BOARD

MISCELLANEOUS

1021	**3103 308 66951**	**CONTROL BOARD (complete assy)**
1801	2422 025 17065	FFC-CONNECTOR 16P, top entry
1802	2422 025 17788	FFC-CONNECTOR 8P, top entry
8021	**3103 308 93110**	**FFC-CABLE 16Pin 60mm AD**

CAPACITORS

2800©	4822 126 13879	220nF	20%	16V
2801©	2238 586 59812	100nF	10%	50V
2802©	2238 586 59812	100nF	10%	50V
2803©	2238 586 59812	100nF	10%	50V
2808	4822 124 40433	47µF	20%	25V
2810©	3198 017 34730	47nF	10%	16V
2811©	2238 586 59812	100nF	10%	50V
2812©	2238 586 59812	100nF	10%	50V
2813©	2238 586 59812	100nF	10%	50V
2814©	2238 586 59812	100nF	10%	50V

RESISTORS

3800©	4822 051 30472	4,7kΩ	5%	0,06W
3801©	4822 051 30472	4,7kΩ	5%	0,06W
3802©	4822 051 30472	4,7kΩ	5%	0,06W
3803©	4822 051 30472	4,7kΩ	5%	0,06W
3804©	4822 051 30472	4,7kΩ	5%	0,06W
3805©	4822 051 30472	4,7kΩ	5%	0,06W
3806©	4822 051 30472	4,7kΩ	5%	0,06W
3807©	4822 051 30472	4,7kΩ	5%	0,06W
3808©	4822 051 30472	4,7kΩ	5%	0,06W
3809©	4822 051 30472	4,7kΩ	5%	0,06W
3810©	4822 051 30103	10kΩ	5%	0,06W
3811©	4822 051 30154	150kΩ	5%	0,0625W
3815©	5322 117 13057	820Ω	1%	0,06W
3816©	4822 051 30479	47Ω	5%	0,06W
3818©	4822 051 30479	47Ω	5%	0,06W
3819©	5322 117 13057	820Ω	1%	0,06W
3820©	5322 117 13057	820Ω	1%	0,06W
3821©	4822 051 30479	47Ω	5%	0,06W
3823©	4822 051 30479	47Ω	5%	0,06W
3824©	5322 117 13057	820Ω	1%	0,06W
3826▲	**4822 117 12148**	**1,5Ω**	**5%**	**0,33W**
3827©	4822 051 30101	100Ω	5%	0,06W
3828©	4822 051 30101	100Ω	5%	0,06W
3829©	4822 051 30101	100Ω	5%	0,06W
3830©	4822 051 30103	10kΩ	5%	0,06W
3831©	4822 051 30103	10kΩ	5%	0,06W
3832©	4822 051 30272	2,7kΩ	5%	0,06W
3833©	4822 051 30272	2,7kΩ	5%	0,06W
3834©	4822 051 30272	2,7kΩ	5%	0,06W
3835©	4822 051 30272	2,7kΩ	5%	0,06W
3836©	4822 051 30272	2,7kΩ	5%	0,06W
3837©	4822 051 30272	2,7kΩ	5%	0,06W
3838©	4822 051 30333	33kΩ	5%	0,06W
3839©	4822 051 30272	2,7kΩ	5%	0,06W
3840©	4822 051 30272	2,7kΩ	5%	0,06W
3841©	4822 051 30103	10kΩ	5%	0,06W
3842©	4822 051 30103	10kΩ	5%	0,06W
3845©	4822 051 20159	15Ω	5%	0,1W
3850©	4822 117 12706	10kΩ	1%	0,06W
3851©	4822 117 12706	10kΩ	1%	0,06W
3852©	4822 117 12706	10kΩ	1%	0,06W
3853©	4822 117 12706	10kΩ	1%	0,06W
3854©	4822 117 12706	10kΩ	1%	0,06W

RESISTORS

3855©	4822 117 12706	10kΩ	1%	0,06W
3856©	4822 117 12706	10kΩ	1%	0,06W
3857©	4822 117 12706	10kΩ	1%	0,06W
3858©	4822 051 30102	1kΩ	5%	0,06W
3859©	4822 051 30103	10kΩ	5%	0,06W
3860©	5322 117 13017	100Ω	1%	0,06W
3861©	2322 704 62002	2kΩ	1%	0,06W
3862©	4822 117 12706	10kΩ	1%	0,06W
3863▲	**4822 053 10228**	**2,2Ω**	**5%**	**1W**
4800©	4822 051 30008	CHIP JUMPER 0603		
4802©	4822 051 30008	CHIP JUMPER 0603		
4803©	4822 051 30008	CHIP JUMPER 0603		
4804©	4822 051 30008	CHIP JUMPER 0603		
4805©	4822 051 20008	CHIP JUMPER 0805		
4806©	4822 051 30008	CHIP JUMPER 0603		
4807©	4822 051 30008	CHIP JUMPER 0603		
4808©	4822 051 30008	CHIP JUMPER 0603		
4809©	4822 051 20008	CHIP JUMPER 0805		
4810©	4822 051 20008	CHIP JUMPER 0805		
4811©	4822 051 30008	CHIP JUMPER 0603		
4812©	4822 051 30008	CHIP JUMPER 0603		
4813©	4822 051 30008	CHIP JUMPER 0603		
4814©	4822 051 30008	CHIP JUMPER 0603		
4816©	4822 051 20008	CHIP JUMPER 0805		
4817©	4822 051 20008	CHIP JUMPER 0805		
4818©	4822 051 20008	CHIP JUMPER 0805		
4819©	4822 051 30008	CHIP JUMPER 0603		
4820©	4822 051 30008	CHIP JUMPER 0603		
4821©	4822 051 20008	CHIP JUMPER 0805		
4822©	4822 051 20008	CHIP JUMPER 0805		

COILS

1800	2422 540 98518	CERAMIC FILTER 8,0MHz

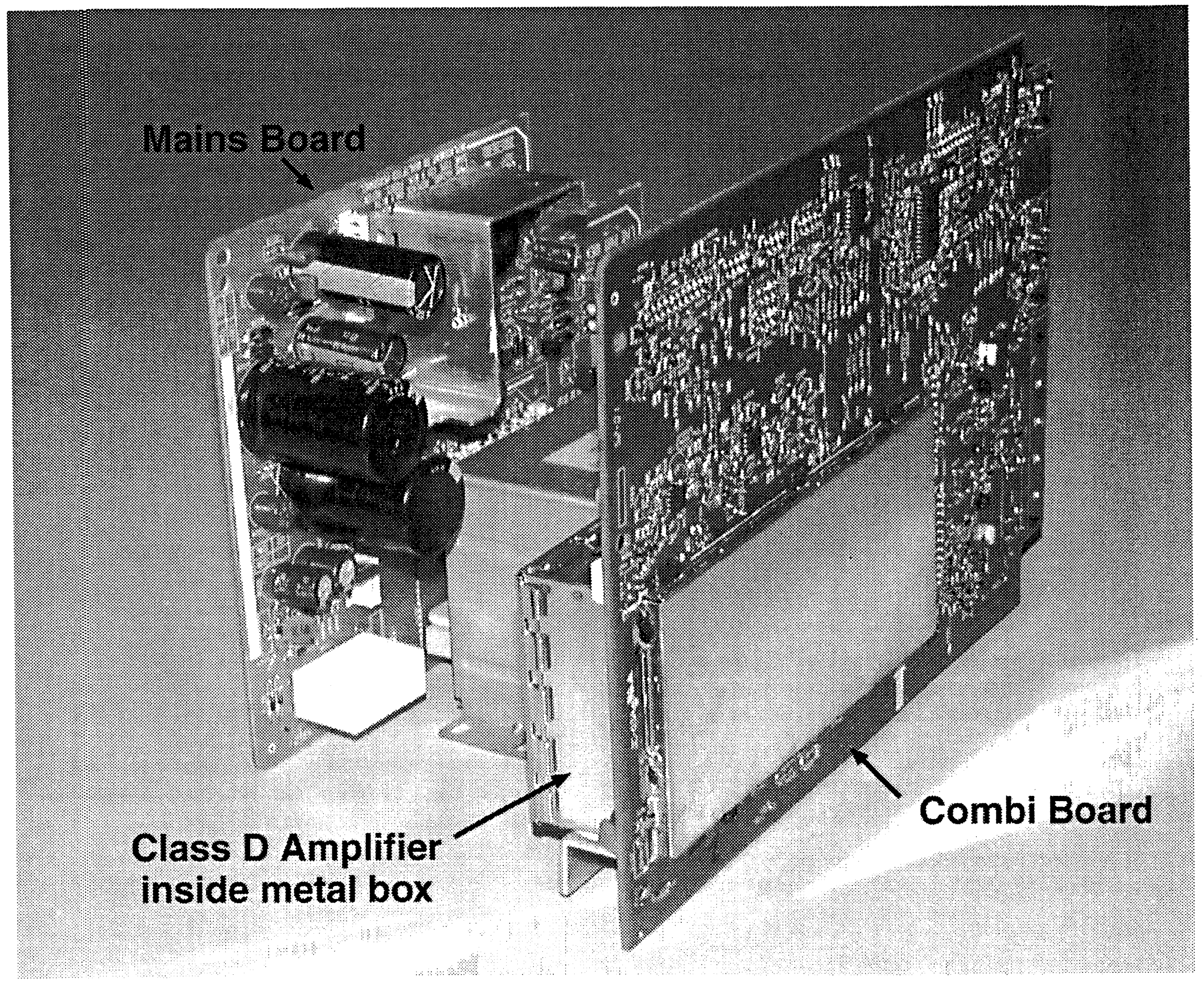
TRANSISTORS

7806©	3198 010 42320	BC857BW

INTEGRATED CIRCUITS

7800	4822 209 72042	MC78L05ACP, STABILIZER
7801©	3103 307 01761	TMP87P809M Mask2, Microcontroller
7803	4822 209 62059	TCA0372DP1, 2-FOLD OP-AMP.
7805	4822 209 62059	TCA0372DP1, 2-FOLD OP-AMP.

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.


Mains Board
Combi Board
Class D Amplifier inside metal box

Power 2003 Module

(75 - 150W Class D)

stage M.6/C.4 update 2

TABLE OF CONTENTS

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COMBI BOARD

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MAINS BOARD
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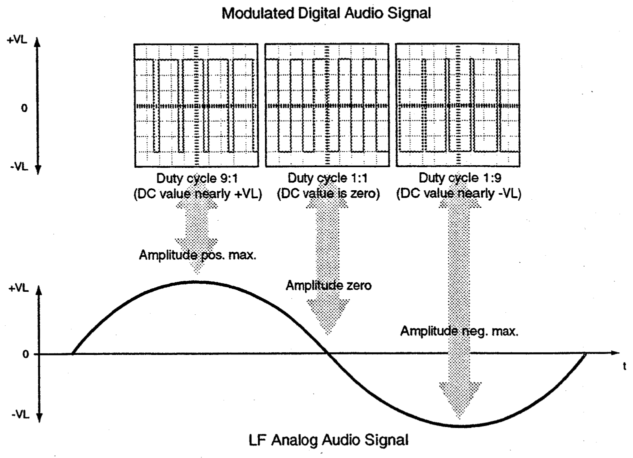
Class-D Circuit Description (BASED ON POWER 2003 MODULE 75-150W CLASS D)

Basically Class-D works by transforming the LF audio input to a square wave signal with a fixed frequency and a variable duty cycle. See simplified drawing below.


Modulated Digital Audio Signal
+VL
0
-VL
Duty cycle 9:1
(DC value nearly +VL)
Duty cycle 1:1
(DC value is zero)
Duty cycle 1:9
(DC value nearly -VL)
Amplitude pos. max.
Amplitude zero
Amplitude neg. max.
+VL
0
-VL
t
LF Analog Audio Signal

The amplitude of the square wave signal is equal to the supply voltage of the amplifier. With the audio signal the square wave signal is pulse-width modulated.

Compared to a conventional power amplfier the benefits of the Class D amplifier are:
- higher effiency
- lower power dissipation
- smaller cooling fin
- smaller mains transformer

Disadvantage of this concept is:
- 500kHz square wave signal with high current requires a shielding box to suppress radiation.

Required Circuitries:

- **500kHz square wave oscillator.**
  The oscillator frequency is created by 7312-3; it is a dual-frequency oscillator with ceramic resonators 5300 and 5302, which resonate at 500kHz and 425kHz respectively. The resonators are switched by transistors 7309 and 7316, controlled by the "OZ_SW" line from the port expander 7406.
  The reason for 2 frequencies is to avoid tuner disturbances in the AM-band.
  The oscillator signal is shaped to square wave with 7312-2, afterwards buffered and fed to the amplifier modulators (ROZ to the right channel, LOZ to the left). One channel gets inverted clock to balance supply loading.

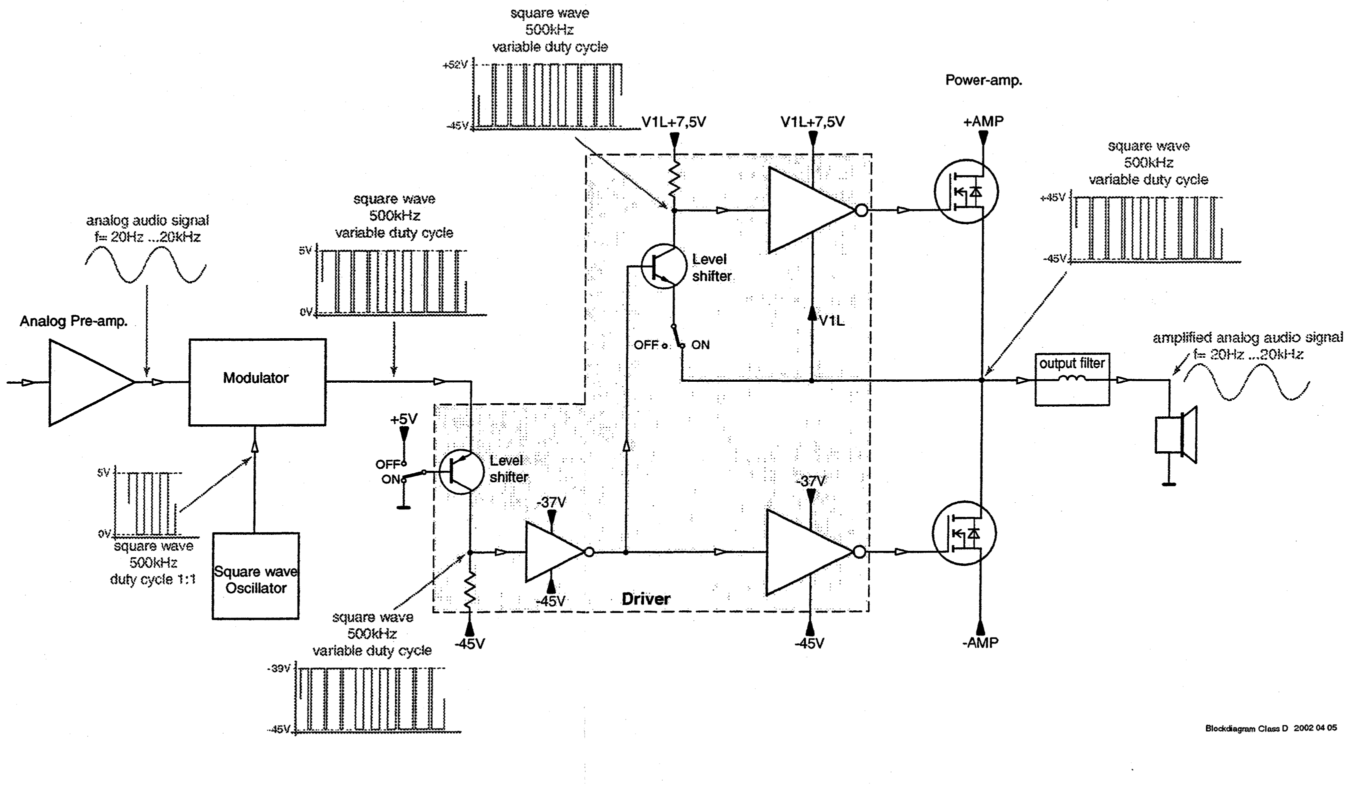
- **Modulator**
  The modulator forms the pulse width modulated signal. For each channel a seperate modulation is required.

- **Power FETs**
  The FETs require drivers which supply the gates. One for the high-side-FET and one for the low-side-FET. Because of the different supply voltages also an additional level shifter is necessary per driver.

- **Output filter**
  The output filter is necessary to block the 500kHz square wave signal from the speaker.
  Refers to the left channel in schematic diagrams.
  It consists of a series-mode coil 5101 and a capacity of approx. 550nF (2116, 2134), which forms a Chebycheff filter with 40kHz cut-off frequency at 6Ω load. For EMC reasons both, the speaker output and the return ground are fed through a common mode coil (5102). The filter is further improved by splitting the output capacity into 2116 before and 2134 after the common mode coil.

All above mentioned circuitries are located inside the metal shielding box.

Blockdiagram Class D


square wave
500kHz
variable duty cycle
+52V
-45V
V1L+7,5V
V1L+7,5V
Power-amp.
+AMP
square wave
500kHz
variable duty cycle
+45V
-45V
analog audio signal
f= 20Hz ...20kHz
square wave
500kHz
variable duty cycle
5V
0V
Level shifter
V1L
Analog Pre-amp.
Modulator
OFF
ON
output filter
amplified analog audio signal
f= 20Hz ...20kHz
+5V
OFF
ON
Level shifter
-37V
-37V
5V
0V
square wave
500kHz
duty cycle 1:1
Square wave Oscillator
-45V
Driver
square wave
500kHz
variable duty cycle
-45V
-45V
-AMP
-39V
-45V
Blockdiagram Class D 2002 04 05

Class-D Circuit Description (Based on Power 2003 Module 75-150W Class D)

Functional Description:

Refers to the left channel in schematic diagrams.
The first stage of the modulator is an error integrator which compares the input to the (24 dB amplified) output signal of the power stage. The difference is leading to a current, which loads the integrator 7122-A. The second stage (7122-B) adds the 500kHz rectangular oscillator signal, creates high gain and low distortion and is again integrating. The output signal leads to a triangle wave form (see oscillogram Ⓔ). The DC value of this triangle signal is floating, dependent on the amplitude of the analog input signal. The next stage is a comparator, which compares the integrated voltage with the internal switching levels - thus creating a voltage controlled duty cycle. 7122 C and D improve the shape of the pulses. For details see oscillograms Ⓐ-Ⓕ.
At pin 8 of IC7122 there is a square wave with the same frequency and duty cycle as the desired output.

The next task is to feed this information to the output FETs. Both FETs are n-channel types, so they are modulated by feeding the gate in respect to the source connection. Inverters 74LV14 are used as drivers. The driver for the low-side FET (7121) is supplied by the negative supply -VL2 and a voltage +VL (generated by 7115 and 6113), which is 7.5V higher than -VL2. The digital signal is level-shifted by 7128 to the low side driver stage. 3142, 6111 and 2126 together form a delay circuit for rising edges by approx. 100ns for the low side FET. 3154, 6109 and 2137 delay the rising edge by 50ns for the high side FET. This to compensate the switch-off delay of the FETs and ensures that both FETs are not conducting at the same time.
The high-side FET (7109) is controlled by the inverted signal taken from pin 2 of 7118, which is level-shifted by transistor 7119. The driver for the high-side FET is supplied by a floating voltage between the amplifier output -V1L and +V1L, created by the charge pump 6110, 2114 regulated by 7114 and 6114 to a 7.5V higher level. The pump is additionally supplied (via 3151) by +45V to ensure supply at start-up (no signal). The last stage in the gate driver consists of three gates in parallel for increased output current for the capacitive load of the FET. For additional increase of the switching speed push/pull transistors 7132/7111 are added.

Protection Circuits:

The amplifier is protected against low load impedance (including short circuit). Current is sensed by shunts 3101, 3130 in both supplies. Overcurrent at the positive supply is then sensed by 7104, the negative supply overcurrent triggers 7117, which then also triggers 7104. The collector current in turn triggers the monoflop 7122-5 and -6, giving a "High" pulse at pin 10. This shuts off level-shifter 7128 and blocks transistor 7129 and 7131, which draws current into the emitter resistor 3134 of level-shifter 7119. It is now also shut off. So, both FETs are shut off within approx. 0,2 sec.
The monoflop can be reset by:
- switching mains off and on again
- pressing Standby button and afterwards any source button
- plugging headphone in for a short moment

When a headphone is used the amplifier is shut off. This is done by pulling pin 13 of 7122 via signal line "AMP_OFF" and transistor 7130 to high level. The line "AMP_OFF" is controlled by the port expander 7406 which detects the headphone via signal line "HP_DET".

The loudspeakers are protected against DC voltages resulting e.g. from defective FETs. Voltages higher than ±2V are detected by 7110 respectively 7112. The transistors conduct and pull the "DC_PROT" line down, blocking transistor 7243 which in turn disables speaker relay 1201.

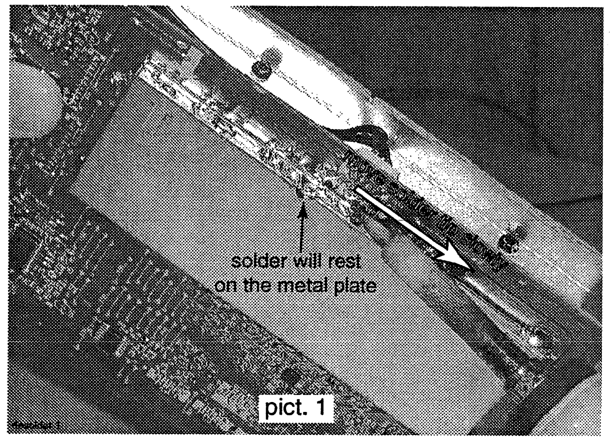
Adjustments:

The gain of the class-D amplifier is 24dB, adjusted by the feedback resistors 3155, 3136, 3149 and the input resistors 3139, 3340. The input reference voltage for 7122-A is approx. half the supply, therefore 3144, 3148 are used for offset compensation. This compensation has to be fine-tuned with trimpotentiometers 3306 and 3307 to obtain <1mV DC output.

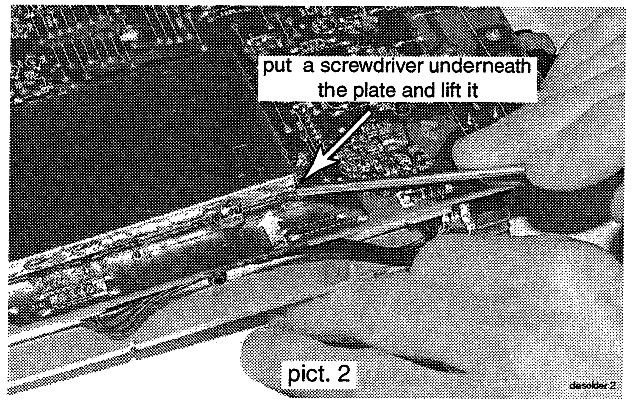
Service Hints:

The analog part of the Combi Board can be repaired without opening the metal shielding box. In case of a 'Class D' problem it is advised to disassemble the board first, desolder the metal bottom cover of the shielding box and assemble the board again. This takes a few minutes only.

To de-solder the metal bottom cover proceed as follows:
1)Remove top cover of shielding box to reduce heat flow
2)Do not use de-solder wick
3)Simply hold the board upright down as shown in picture 1. Heat up solder joints and move tip of soldering iron slowly along the edge of the metal frame.
Solder will flow along the soldering tip and rest on the metal plate. A small amount will drop off.
A small gap will become visible as indication that the solder connection is released.
When all solder joints are released the cover can be removed by help of a screwdriver. Begin at the corner indicated by an arrow → see picture 2.



pict. 1



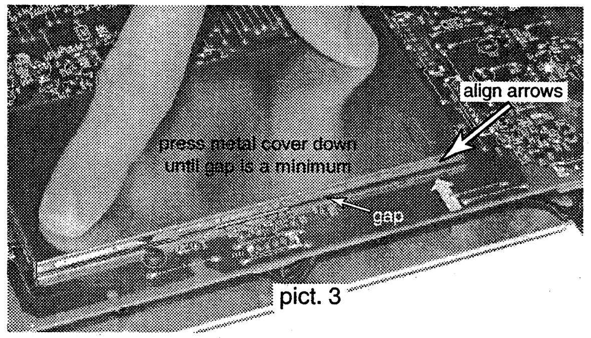
pict. 2

To re-mount the metal bottom cover proceed as follows:
1)The solder connections are not distributed evenly. Therefore the cover has to be mounted in that way that the arrow indicator on the cover is positioned in line with the arrow printed on the printed board → see picture 3.

Service Hints

2)Press the metal cover smoothly down until the gap between cover and printed board becomes a minimum. This is important for proper shielding.
3)Heat up the residual solder on the metal cover. The solder will flow back to the solder areas. If necessary apply additional new solder.
4)Take care that all solder joints are re-soldered again.

Attention: Poor soldering of the metal shielding box results in disturbance of the tuner.



pict. 3

In most cases the FETs 7109 and/or 7121 for the left channel, respectively 7218 and/or 7231 for the right channel will be defective. This can easily be checked with an ordinary Ohm-meter.

Left Channel:
In case **7109** is defect replace following parts:
7109, 7111, 7132, 7105, 7119, 7104, 3101, 3103 and 2106

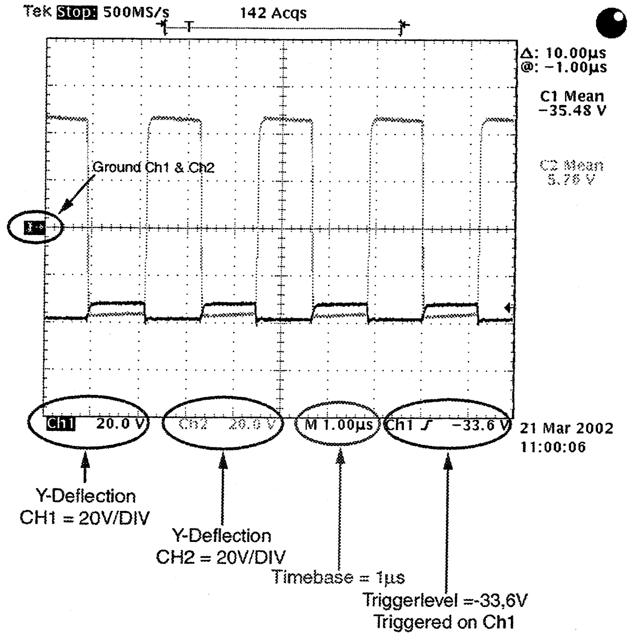
In case **7121** is defect replace following parts:
7121, 7113, 7133, 7118, 7117, 3129, 3130 and 2118

Right Channel:
In case **7218** is defect replace following parts:
7218, 7221, 7244, 7209, 7228, 7208, 3205, 3209 and 2206

In case **7231** is defect replace following parts:
7231, 7210, 7245, 7235, 7227, 3241, 3243 and 2220

Attention: Do not forget to adjust the DC-offset after replacing the FET!
If none of the FETs is defective the fault is most probably located in the modulator. To check the operation - follow the given signals.

General description of Oscilloscope setup:

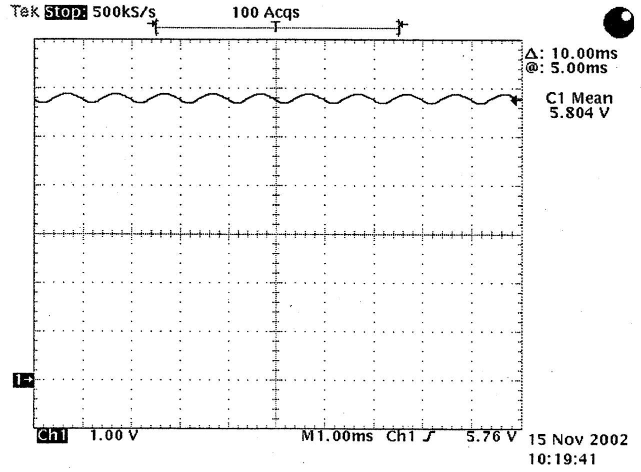


The following signals are measured on condition:
AUX in = 500mV/1kHz, Volume = -28dB
Load = 2 x 6Ω

Measuring point Ⓐ can be found on circuit diagram [3].

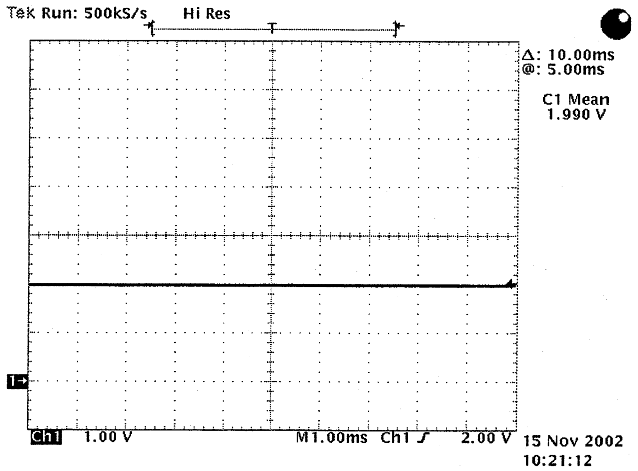
All other measuring points are shown on circiut diagram [4] respectively [5].

Measuring point Ⓐ: Output pre-amplifier

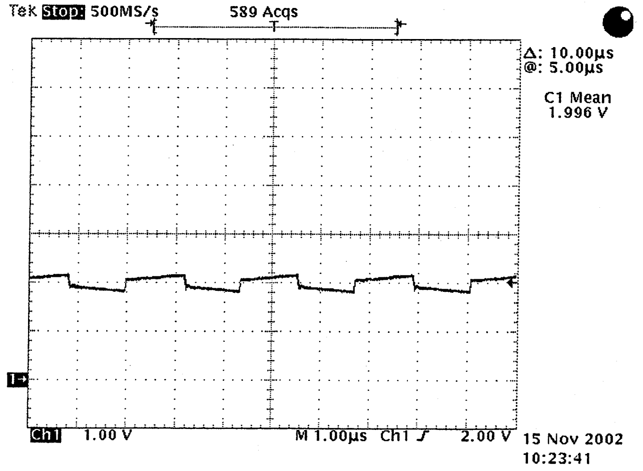


Normal analog signal measured (1kHz- Timebase 1µs). If this signal can´t be measured - the fault is outside the shielding box.

Measuring point Ⓑ: Input Modulator

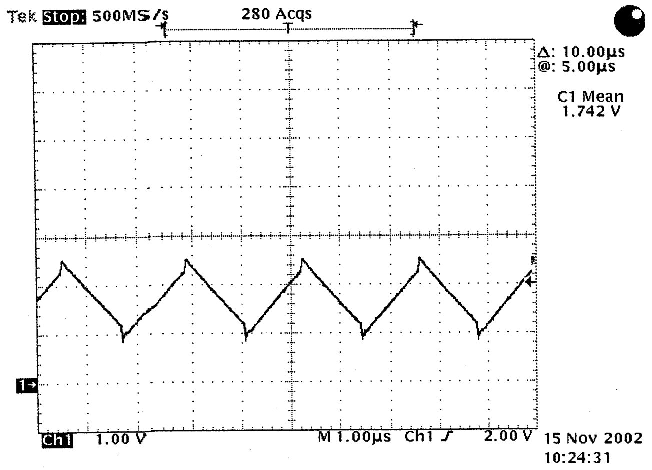


The 1kHz signal is not visible anymore. Reducing the timebase to 1µs shows the oscillogram below.



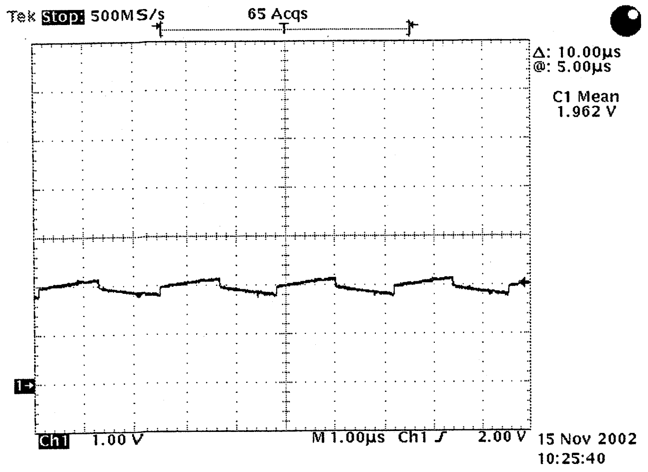
Service Hints

Measuring point Ⓒ:



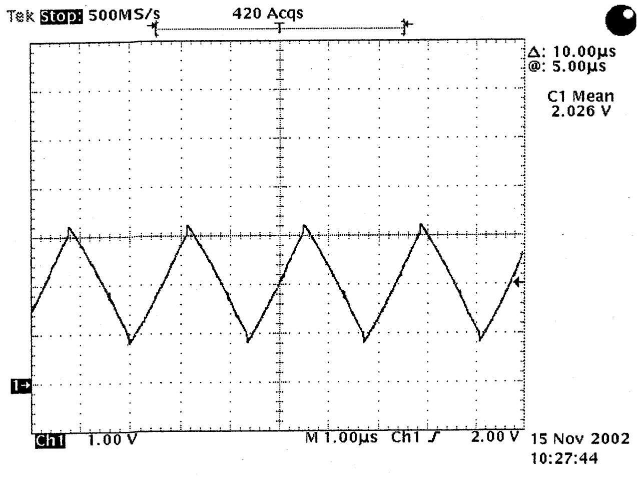
The first stage of the modulator is an integrator. An integrated rectangle results in a triangle.

Measuring point Ⓓ:



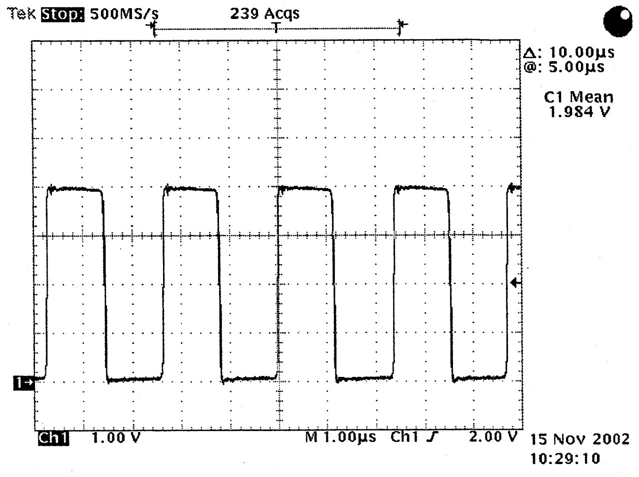
The oscillator signal (squarewave) is fed to the second integrator (7122-B).

Measuring point Ⓔ:



The integrated rectangle results in a triangle. 7122-C works as a comparator. 7122-D improves the shape of the pulses.

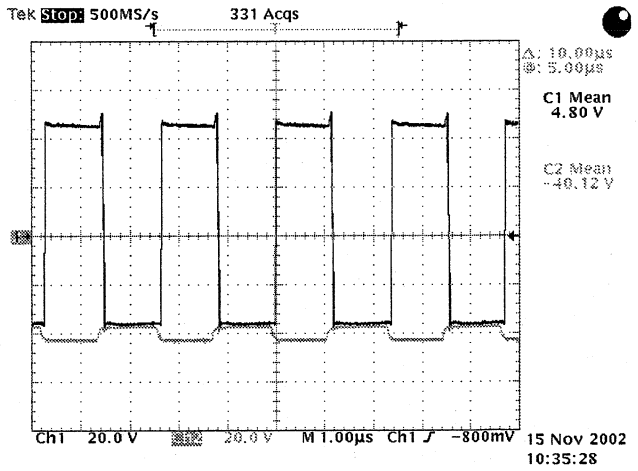
Measuring point Ⓕ: Output modulator



In this pulse width modulated square wave the analog Audio signal is included. Measurements with an analog scope will show a jitter on the falling edge.

The modulator frequency is still fixed to 500kHz. Similar to a frequency modulation - in this case the amplitude of the analog audio signal varies the pulse width, the frequency defines the speed.

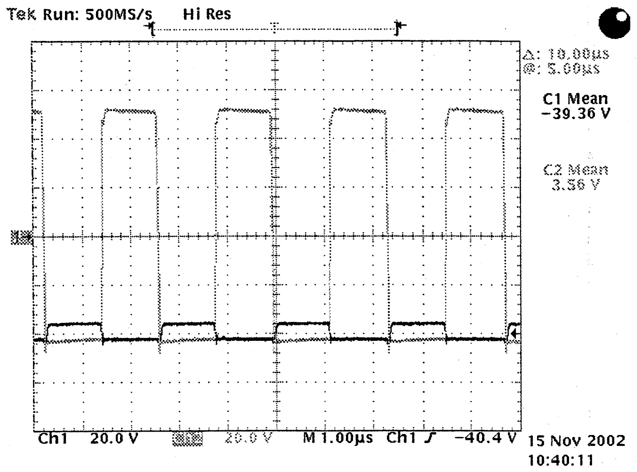
Measuring point Ⓖ:



The low-side driver signal <G1> (Ch2) is the modulator output level-shifted by transistor 7128. The high-side driver signal <G2> (Ch1) is the inverted low-side driver signal level-shifted by transistor 7119.

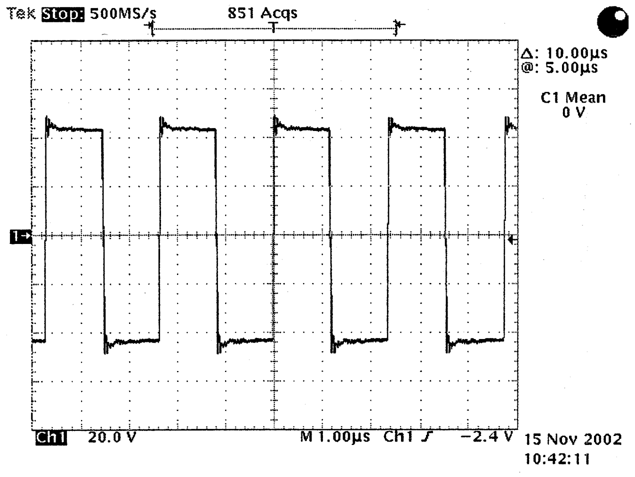
Service Hints

Measuring point Ⓗ: gate-signal of the FETs



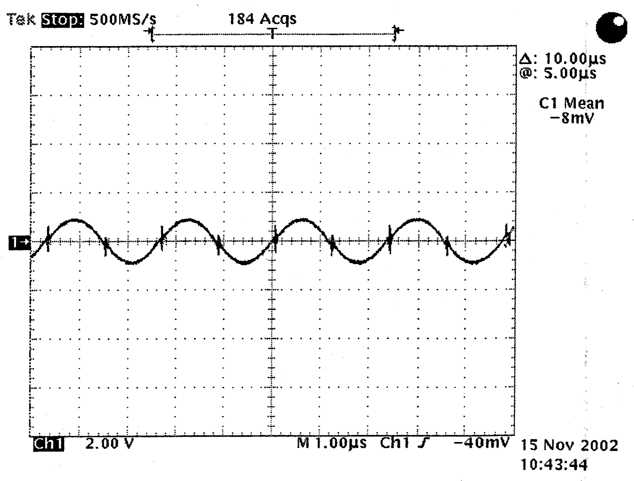
Ch1 = H1, CH2 = H2

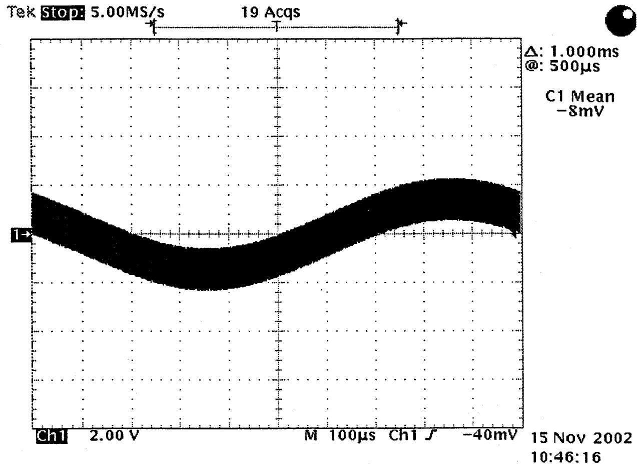
Measuring point Ⓘ:

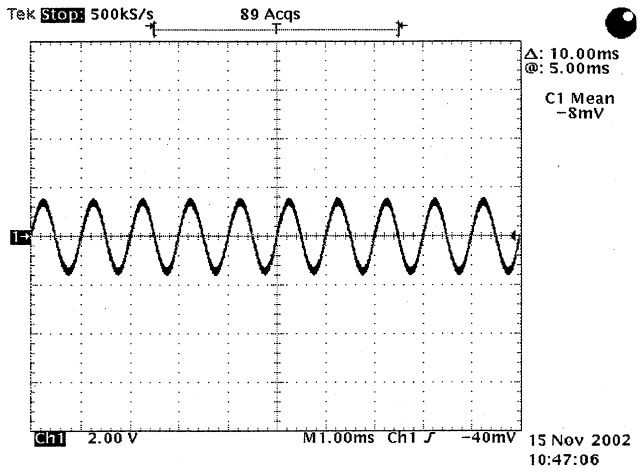


Digital output signal.

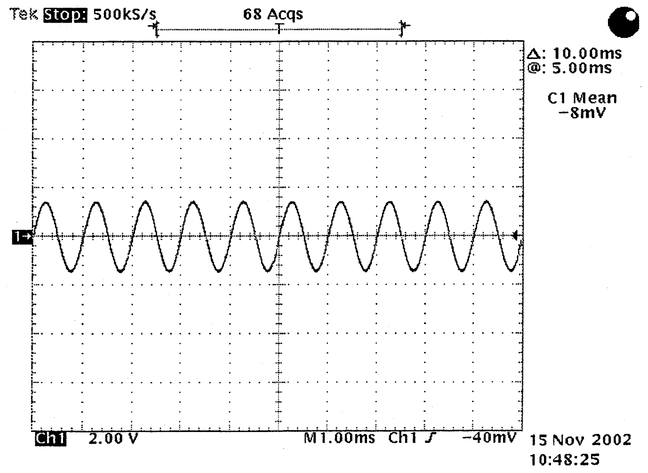
Measuring point Ⓙ:
The following three signals are measured after output filter 5101 with different timebases.





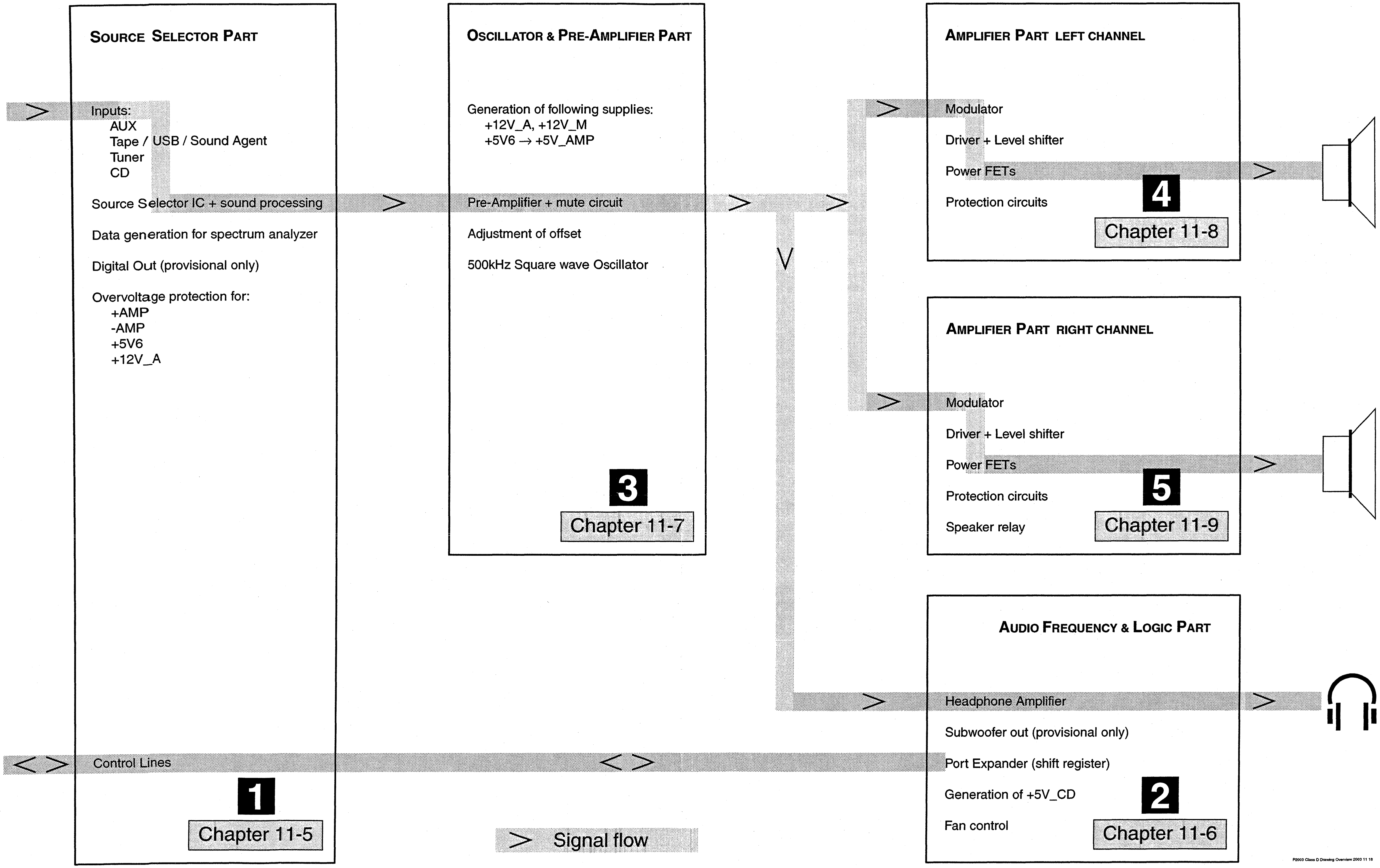


Measuring point Ⓚ:



After common mode coil 5102 - the audio signal is restored.

Power 2003 75 - 150W Class D
Combi Board Circuit Diagram Overview



SOURCE SELECTOR PART

Inputs:
- AUX
- Tape / USB / Sound Agent
- Tuner
- CD

Source Selector IC + sound processing

Data generation for spectrum analyzer

Digital Out (provisional only)

Overvoltage protection for:
- +AMP
- -AMP
- +5V6
- +12V_A

Control Lines

1 Chapter 11-5

OSCILLATOR & PRE-AMPLIFIER PART

Generation of following supplies:
- +12V_A, +12V_M
- +5V6 → +5V_AMP

Pre-Amplifier + mute circuit

Adjustment of offset

500kHz Square wave Oscillator

3 Chapter 11-7

AMPLIFIER PART LEFT CHANNEL

Modulator

Driver + Level shifter

Power FETs

Protection circuits

4 Chapter 11-8

AMPLIFIER PART RIGHT CHANNEL

Modulator

Driver + Level shifter

Power FETs

Protection circuits

Speaker relay

5 Chapter 11-9

AUDIO FREQUENCY & LOGIC PART

Headphone Amplifier

Subwoofer out (provisional only)

Port Expander (shift register)

Generation of +5V_CD

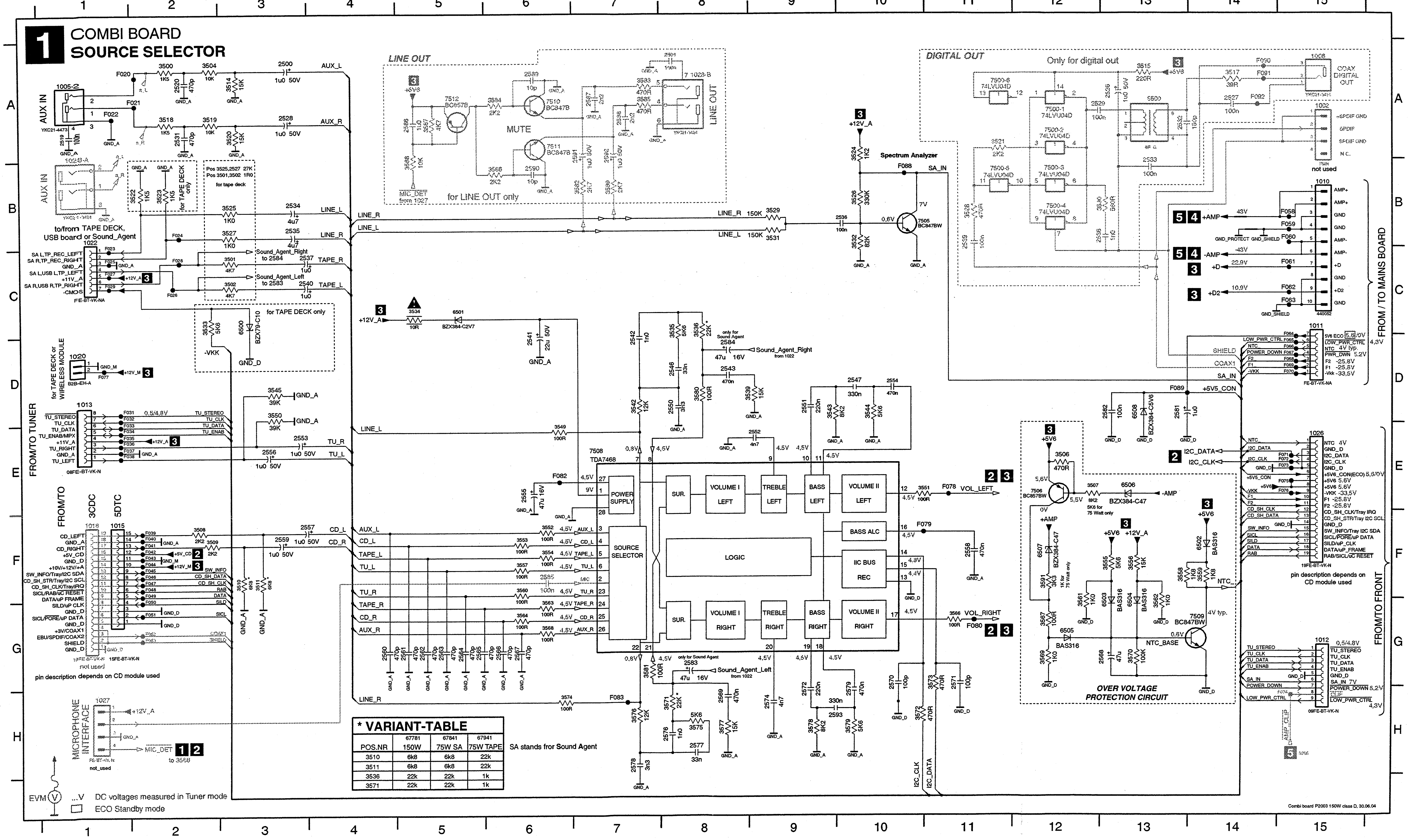
Fan control

2 Chapter 11-6

> Signal flow

1002	A15
1005-1	A1
1005-2	A1
1006	A15
1010	B15
1011	C15
1012	G15
1013	D1
1015	F1
1018	F1
1020	D1
1022	B1
1026	E15
1027	G1
1028–A	B1
1028–B	A8
2500	A3
2501	A8
2519	B1
2520	A2
2526	A13
2527	A14
2528	A3
2529	A12
2531	A2
2532	A13
2533	B13
2534	B3
2535	B3
2536	B10
2537	C3
2538	B12
2539	B11
2540	C3
2541	D6
2542	D7
2543	D8
2546	D8
2547	D10
2550	D8
2551	D9
2552	E9
2553	E3
2554	D10
2555	E6
2556	E3
2557	F3
2558	F11
2559	F3
2560	G4
2561	G5
2562	G5
2563	G5
2564	G5
2565	G5
2566	G6
2567	G6
2568	G13
2569	H8
2570	G10
2571	G11
2572	H9
2574	H9
2576	H8
2577	H8
2578	H7
2579	H10
2581	D13
2582	D13
2583	G8
2584	D8
2585	F6
2586	A5
2587	A7
2588	A7
2589	A6
2590	B6
2591	A7
2592	A7
2593	H9
3500	A2
3501	C3
3502	C3
3504	A2
3506	E12
3507	E12
3508	F2
3509	F2
3510	F3
3511	F3
3514	A3
3515	A13
3517	A14
3518	A2
3519	A2
3520	A3
3521	A11
3522	B2
3523	B2
3524	A10
3525	B3
3526	B10
3527	B3
3528	B11
3529	B9
3530	B13
3531	B9
3532	B10
3533	C2
3534	C5
3535	C8
3536	C8
3539	D9
3542	D7
3543	D9
3544	D10
3545	D3
3549	E6
3550	D3
3551	E10
3552	F6
3553	F6
3554	F6
3555	F13
3556	F13
3557	F6
3558	F13
3559	F14
3560	F6
3561	G12
3562	G13
3563	G6
3564	G6
3566	G11
3567	G12
3568	G6
3569	G12
3570	G13
3571	H8
3572	H10
3573	G11
3574	H6
3575	H8
3576	H7
3577	H8
3578	H9
3579	H10
3580	D8
3581	G7
3582	B7
3583	A7
3584	A6
3585	A7
3586	B6
3587	A5
3588	B5
3589	B7
3591	F12
5500	A13
6500	C3
6501	C5
6502	F14
6503	G13
6504	G13
6505	G12
6506	E13
6507	F12
6508	D13
7500-1	A12
7500-2	A12
7500-3	B12
7500-4	B12
7500-5	B11
7500-6	A11
7505	B10
7506	E12
7508	E7
7509	G14
7510	A6
7511	A6
7512	A5
F020	A1
F021	A2
F022	A1
F023	B1
F024	B2
F025	C1
F026	C2
F027	C1
F028	C2
F029	C1
F031	D2
F032	D2
F033	D2
F034	E2
F035	E2
F036	E2
F037	E2
F038	E2
F039	F2
F040	F2
F041	F2
F042	F2
F043	F2
F044	F2
F045	F2
F046	F2
F047	F2
F048	F2
F049	F2
F050	F2
F051	G2
F052	G2
F053	G2
F058	B15
F059	B14
F060	B15
F061	C15
F062	C15
F063	C15
F064	C15
F065	D15
F066	D15
F067	D15
F068	D15
F069	D15
F070	D15
F071	E15
F072	E15
F073	E15
F074	H15
F075	E15
F076	E15
F077	D1
F078	E11
F079	F10
F080	G11
F082	E6
F083	H7
F088	B10
F089	D13
F090	A14
F091	A14
F092	A14

1 COMBI BOARD SOURCE SELECTOR



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H
AUX IN
1005-2
1028-A
to/from TAPE DECK, USB board or Sound_Agent
1022
for TAPE DECK only
Pos 3525,2527 27K Pos 3501,3502 1R0 for tape deck
for TAPE DECK or WIRELESS MODULE
1020
FROM/TO TUNER
1013
FROM/TO 3CDC 5DTC
1018 1015
not used
pin description depends on CD module used
MICROPHONE INTERFACE
1027
MIC_DET
to 3588
not_used
LINE OUT
MUTE
for LINE OUT only
7512 BC857B
7510 BC847B
7511 BC847B
1028-B
AUX_L
AUX_R
LINE_L
LINE_R
TAPE_L
TAPE_R
TU_L
TU_R
CD_L
CD_R
Sound_Agent_Right
Sound_Agent_Left
+12V_A
BZX384-C2V7
Spectrum Analyzer
SA_IN
7505 BC847BW
7508 TDA7468
POWER SUPPLY
SOURCE SELECTOR
SUR.
VOLUME I LEFT
VOLUME I RIGHT
TREBLE LEFT
TREBLE RIGHT
BASS LEFT
BASS RIGHT
VOLUME II LEFT
VOLUME II RIGHT
BASS ALC
LOGIC
IIC BUS
REC
VOL_LEFT
VOL_RIGHT
I2C_CLK
I2C_DATA
DIGITAL OUT
Only for digital out
74LVU04D
5500
COAX DIGITAL OUT
1006
1002
not used
1010
FROM / TO MAINS BOARD
1011
+AMP
-AMP
+D
+D2
GND_PROTECT
GND_SHIELD
SHIELD
COAX1
7506 BC857BW
6506 BZX384-C47
7509 BC847BW
NTC_BASE
OVER VOLTAGE PROTECTION CIRCUIT
1026
1012
FROM/TO FRONT

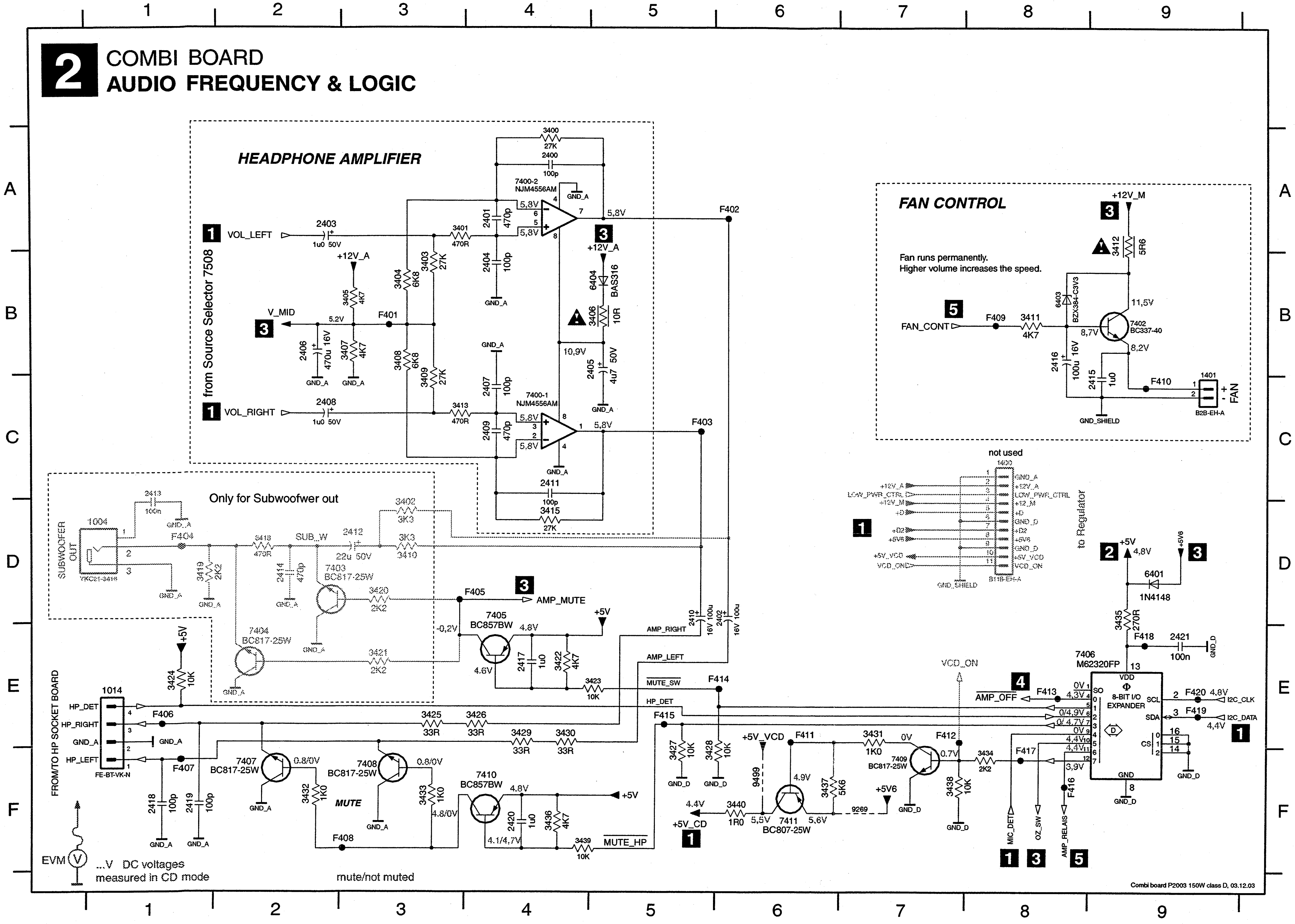
* VARIANT-TABLE			
POS.NR	67781 150W	67841 75W SA	67941 75W TAPE
3510	6k8	6k8	22k
3511	6k8	6k8	22k
3536	22k	22k	1k
3571	22k	22k	1k

SA stands fror Sound Agent

EVM (V) ...V DC voltages measured in Tuner mode
☐ ECO Standby mode

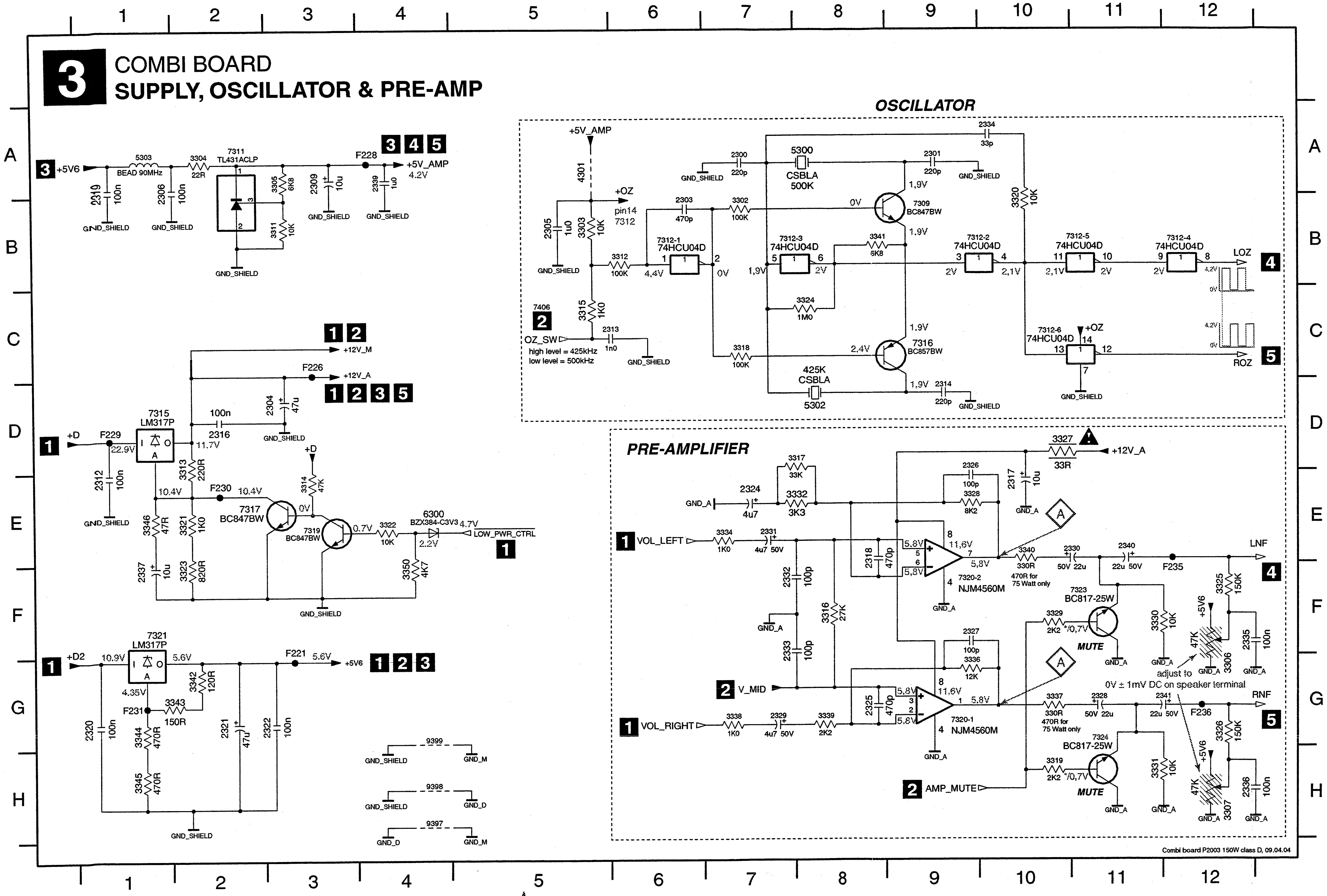
Combi board P2003 150W class D, 30.06.04

2 COMBI BOARD
AUDIO FREQUENCY & LOGIC


1 2 3 4 5 6 7 8 9
A B C D E F
HEADPHONE AMPLIFIER
from Source Selector 7508
1 VOL_LEFT
2403 1u0 50V
3401 470R
2401 470p
2404 100p
3400 27K
2400 100p
7400-2 NJM4556AM
5,8V
GND_A
F402
3 +12V_A
6404 BAS316
3406 10R
+12V_A
3405 4K7
3404 6K8
3403 27K
V_MID
3
5.2V
F401
2406 470u 16V
3407 4K7
3408 6K8
3409 27K
2407 100p
10,9V
2405 4u7 50V
1 VOL_RIGHT
2408 1u0 50V
3413 470R
2409 470p
7400-1 NJM4556AM
F403
2411 100p
3415 27K
Only for Subwoofwer out
SUBWOOFER OUT
1004
YKC21-3416
2413 100n
F404
3419 2K2
3418 470R
SUB_W
2414 470p
2412 22u 50V
3402 3K3
3410 3K3
7403 BC817-25W
3420 2K2
7404 BC817-25W
3421 2K2
F405
3 AMP_MUTE
7405 BC857BW
4.8V
-0,2V
4.6V
+5V
2417 1u0
3422 4K7
3423 10K
AMP_RIGHT
AMP_LEFT
MUTE_SW
HP_DET
2410 16V 100u
2402 16V 100u
F414
F415
+5V
3424 10K
1014
HP_DET
HP_RIGHT
GND_A
HP_LEFT
FE-BT-VK-N
FROM/TO HP SOCKET BOARD
F406
F407
3425 33R
3426 33R
3429 33R
3430 33R
7407 BC817-25W
0.8/0V
7408 BC817-25W
0.8/0V
3432 1K0
3433 1K0
MUTE
4.8/0V
7410 BC857BW
4.8V
+5V
2420 1u0
3436 4K7
4.1/4,7V
3439 10K
MUTE_HP
F408
2418 100p
2419 100p
EVM
...V DC voltages measured in CD mode
mute/not muted
3427 10K
3428 10K
+5V_VCD
F411
9499
7411 BC807-25W
4.9V
3437 5K6
4.4V
3440 1R0
5,5V
5.6V
+5V_CD
1
9269
+5V6
3431 1K0
0V
7409 BC817-25W
F412
0.7V
3434 2K2
3438 10K
F417
VCD_ON
FAN CONTROL
Fan runs permanently.
Higher volume increases the speed.
+12V_M
3
3412 5R6
5 FAN_CONT
F409
3411 4K7
6403 BZX384-C3V3
7402 BC337-40
11,5V
8,7V
8,2V
2416 100u 16V
2415 1u0
F410
1401
B2B-EH-A
+ FAN -
GND_SHIELD
not used
1400
B11B-EH-A
+12V_A
LOW_PWR_CTRL
+12V_M
+D
+D2
+5V6
+5V_VCD
VCD_ON
GND_A
GND_D
GND_SHIELD
to Regulator
1
2 +5V 4,8V
+5V6 3
6401 1N4148
3435 270R
F418
2421 100n
7406 M62320FP
VDD
8-BIT I/O EXPANDER
SCL
SDA
CS
GND
4 AMP_OFF
F413
0V
4,3V
0/4,9V
0/4,7V
4,4V
3,9V
F420 4,8V
I2C_CLK
F419
I2C_DATA
4,4V
1
MIC_DET
OZ_SW
AMP_RELAIS
F416
1 3 5
Combi board P2003 150W class D, 03.12.03

1004	D1
1014	E1
1400	C8
1401	C9
2400	A4
2401	A4
2402	D6
2403	A2
2404	B4
2405	B5
2406	B2
2407	C4
2408	C2
2409	C4
2410	D5
2411	C4
2412	D3
2413	C1
2414	D2
2415	C9
2416	B8
2417	E4
2418	F1
2419	F1
2420	F4
2421	E9
3400	A4
3401	A3
3402	D3
3403	B3
3404	B3
3405	B3
3406	B5
3407	B3
3408	B3
3409	C3
3410	D3
3411	B8
3412	A9
3413	C3
3415	D4
3418	D2
3419	D1
3420	D3
3421	E3
3422	E4
3423	E5
3424	E1
3425	E3
3426	E4
3427	F5
3428	F5
3429	E4
3430	E4
3431	E7
3432	F2
3433	F3
3434	F8
3435	D9
3436	F4
3437	F6
3438	F7
3439	F4
3440	F6
6401	D9
6403	B8
6404	B5
7400-1	C4
7400-2	A4
7402	B9
7403	D3
7404	E2
7405	D4
7406	E9
7407	F2
7408	F3
7409	F7
7410	F4
7411	F6
9269	F7
9499	F6
F401	B3
F402	A6
F403	C5
F404	D1
F405	D4
F406	E1
F407	F1
F408	F3
F409	B8
F410	C9
F411	E6
F412	E8
F413	E8
F414	E6
F415	E5
F416	F8
F417	E8
F418	E9
F419	E9
F420	E9

3 COMBI BOARD
SUPPLY, OSCILLATOR & PRE-AMP


OSCILLATOR
PRE-AMPLIFIER
+5V6
5303 BEAD 90MHz
3304 22R
7311 TL431ACLP
F228
+5V_AMP 4.2V
2319 100n
2306 100n
3305 6K8
3311 10K
2309 10u
2339 1u0
GND_SHIELD
+12V_M
+12V_A
F226
2304 47u
+D
F229
22.9V
7315 LM317P
2312 100n
100n 2316
11.7V
3313 220R
F230 10.4V
10.4V
3314 47K
7317 BC847BW
7319 BC847BW
0V
0.7V
3322 10K
6300 BZX384-C3V3 4.7V
2.2V
LOW_PWR_CTRL
3346 47R
3321 1K0
2337 10u
3323 820R
3350 4K7
+D2
10.9V
7321 LM317P
5.6V
4.35V
F231
3343 150R
3342 120R
F221 5.6V
+5V6
2320 100n
3344 470R
3345 470R
2321 47u
2322 100n
9399 GND_SHIELD GND_M
9398 GND_SHIELD GND_D
9397 GND_D GND_M
+5V_AMP
4301
+OZ
pin14 7312
2305 1u0
3303 10K
3312 100K
4.4V
7406
OZ_SW
high level = 425kHz
low level = 500kHz
3315 1K0
2313 1n0
2300 220p
5300 CSBLA 500K
2301 220p
2334 33p
2303 470p
3302 100K
7312-1 74HCU04D
7312-3 74HCU04D
7309 BC847BW
3341 6K8
3324 1M0
7312-2 74HCU04D
7312-5 74HCU04D
7312-4 74HCU04D
3320 10K
7312-6 74HCU04D
7316 BC857BW
3318 100K
425K CSBLA 5302
2314 220p
LOZ
ROZ
4.2V
0V
3327 33R
+12V_A
3317 33K
2324 4u7
3332 3K3
2326 100p
3328 8K2
2317 10u
GND_A
VOL_LEFT
3334 1K0
2331 4u7 50V
2318 470p
2332 100p
7320-2 NJM4560M
11,6V
5,8V
3340 330R
470R for 75 Watt only
2330 50V 22u
2340 22u 50V
F235
LNF
7323 BC817-25W
3329 2K2
*/0,7V
MUTE
3330 10K
3325 150K
2335 100n
+5V6
47K 3306
adjust to
0V ± 1mV DC on speaker terminal
3316 27K
2333 100p
2327 100p
3336 12K
V_MID
2325 470p
7320-1 NJM4560M
VOL_RIGHT
3338 1K0
2329 4u7 50V
3339 2K2
3337 330R
2328 50V 22u
2341 22u 50V
F236
RNF
7324 BC817-25W
3319 2K2
3331 10K
3326 150K
47K 3307
2336 100n
AMP_MUTE
A
Combi board P2003 150W class D, 09.04.04

2300	A7
2301	A9
2303	B6
2304	D3
2305	B5
2306	A1
2309	A3
2312	E1
2313	C6
2314	D9
2316	D2
2317	E10
2318	E8
2319	A1
2320	H1
2321	G2
2322	G3
2324	E7
2325	G8
2326	D9
2327	F9
2328	G11
2329	G7
2330	E11
2331	E7
2332	F7
2333	F7
2334	A10
2335	F12
2336	H12
2337	F1
2339	A4
2340	E11
2341	G12
3302	B7
3303	B5
3304	A2
3305	A3
3306	G12
3307	H12
3311	B3
3312	B6
3313	D2
3314	E3
3315	C5
3316	F8
3317	D8
3318	C7
3319	H10
3320	B10
3321	E2
3322	E4
3323	F2
3324	C8
3325	F12
3326	G12
3327	D10
3328	E9
3329	F10
3330	F11
3331	H11
3332	E8
3334	E7
3336	G9
3337	G10
3338	G7
3339	G8
3340	E10
3341	B8
3342	G2
3343	G1
3344	G1
3345	H1
3346	E1
3350	F4
4301	A5
5300	A8
5302	D8
5303	A1
6300	E4
7309	B9
7311	B2
7312-1	B6
7312-2	B10
7312-3	B8
7312-4	B12
7312-5	B11
7312-6	C10
7315	D1
7316	C9
7317	E2
7319	E3
7320-1	G9
7320-2	F9
7321	F1
7323	F10
7324	G11
9397	H4
9398	H4
9399	G4
F221	F3
F226	C3
F228	A4
F229	D1
F230	E2
F231	G2
F235	F12
F236	G12

EVM (V)

...V DC voltages measured in tuner mode

.../...V off/on

* ... not defined, floating

◇ for wave forms see chapter 11-2 Service Hints

Attention:
Adjustment to 0V ± 1mV DC has to be done with "cold" set.
After operating a few minutes the value may increase up to 30mV.

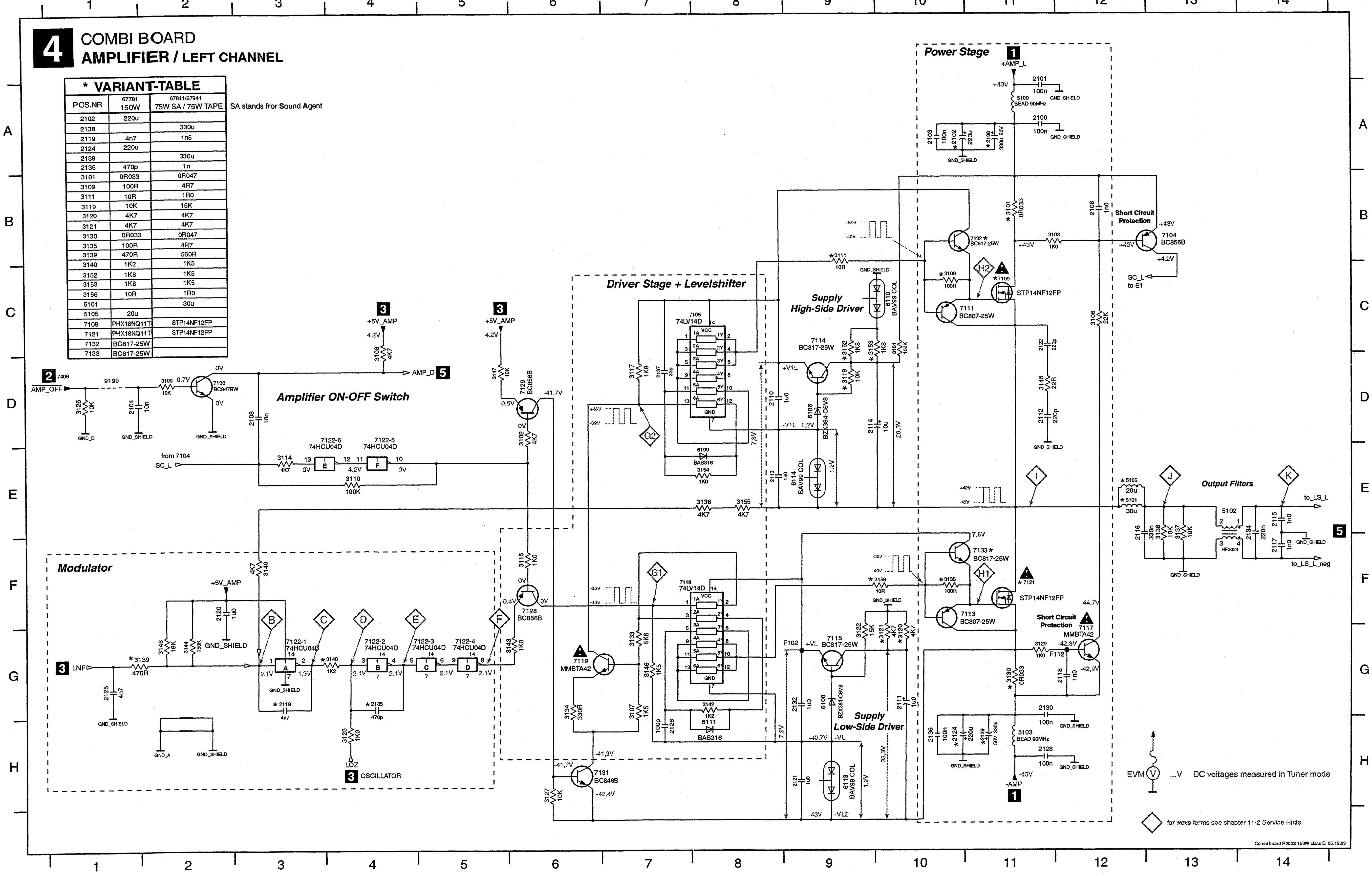
2100	A11
2101	A11
2102	A10
2103	A10
2104	D1
2106	B12
2108	D3
2110	D8
2111	G10
2112	D11
2113	E8
2114	D10
2115	E14
2116	F12
2117	F14
2118	G12
2119	G3
2120	F2
2121	H9
2122	C11
2124	H10
2125	G1
2126	H7
2128	H11
2130	G11
2132	G9
2134	F14
2135	G4
2136	H10
2137	D7
2138	A11
2139	H11
3100	D2
3101	B11
3102	E6
3103	B11
3106	C12
3107	G7
3108	C4
3109	C10
3110	E4
3111	C9
3114	E3
3115	F6
3117	D7
3119	D9
3120	G10
3121	G10
3122	G9
3125	H4
3126	D1
3127	H6
3129	G11
3130	G11
3133	G7
3134	G6
3135	F10
3136	E8
3137	F13
3138	F13
3139	G1
3140	G4
3142	G8
3143	G5
3144	G2
3145	D11
3146	G7
3147	D5
3148	G2
3149	F3
3151	C10
3152	C9
3153	C9
3154	E8
3155	E8
3156	F10
5100	A11
5101	E12
5102	F13
5103	H11
5105	E12
6106	D9
6108	G9
6109	E8
6110	C10
6111	H8
6113	H9
6114	E9
7104	B13
7105	C7
7109	C11
7111	C10
7113	F10
7114	D9
7115	G9
7117	G12
7118	F7
7119	G6
7121	F11
7122-1	G3
7122-2	G4
7122-3	G4
7122-4	G5
7122-5	E4
7122-6	E3
7128	F6
7129	D6
7130	D2
7131	H6
7132	B11
7133	F11
9199	D1
F102	G9
F112	G12
F114	D14

4 COMBI BOARD
AMPLIFIER / LEFT CHANNEL

*** VARIANT-TABLE**

POS.NR	67781 150W	67841/67941 75W SA / 75W TAPE
2102	220u	
2138		330u
2119	4n7	1n5
2124	220u	
2139		330u
2135	470p	1n
3101	0R033	0R047
3109	100R	4R7
3111	10R	1R0
3119	10K	15K
3120	4K7	4K7
3121	4K7	4K7
3130	0R033	0R047
3135	100R	4R7
3139	470R	560R
3140	1K2	1K5
3152	1K8	1K5
3153	1K8	1K5
3156	10R	1R0
5101		30u
5105	20u	
7109	PHX18NQ11T	STP14NF12FP
7121	PHX18NQ11T	STP14NF12FP
7132	BC817-25W	
7133	BC817-25W	

SA stands fror Sound Agent


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
Power Stage
1
+AMP_L
+43V
2101
100n
GND_SHIELD
5100
BEAD 90MHz
2100
100n
2103
100n
2102
220u
2138
330u 50V
3101
0R033
2106
1n0
Short Circuit Protection
7104
BC856B
3103
1K0
+4.2V
SC_L to E1
7132
BC817-25W
3109
100R
H2
7109
STP14NF12FP
7111
BC807-25W
3106
22K
2122
220p
3145
22R
2112
220p
Driver Stage + Levelshifter
7105
74LV14D
VCC
GND
3117
1K8
2137
33p
G2
6109
BAS316
3154
1K0
3136
4K7
3155
4K7
Supply High-Side Driver
3111
10R
6110
BAV99 COL
7114
BC817-25W
3152
1K8
3153
1K8
3151
100K
3119
10K
+V1L
-V1L
1.2V
6106
BZX384-C6V8
2110
1u0
2113
1u0
6114
BAV99 COL
2114
10u
7,8V
29,3V
3
+5V_AMP
4.2V
3108
4K7
AMP_D
5
3147
10K
7129
BC856B
-41,7V
0.5V
3102
4K7
2
7406
AMP_OFF
9199
3100
10K
0.7V
7130
BC847BW
0V
3126
10K
2104
10n
GND_D
2108
10n
Amplifier ON-OFF Switch
7122-6
74HCU04D
7122-5
74HCU04D
from 7104
SC_L
3114
4K7
3110
100K
I
J
K
Output Filters
5105
20u
5101
30u
5102
HF2024
2116
330n
3138
10K
3137
10K
2134
220n
2115
1n0
2117
1n0
to_LS_L
to_LS_L_neg
Modulator
+5V_AMP
2120
1u0
3148
18K
3144
150K
3149
4K7
B
C
D
E
F
LNF
3139
470R
2125
4n7
7122-1
74HCU04D
7122-2
74HCU04D
7122-3
74HCU04D
7122-4
74HCU04D
2119
4n7
3140
1K2
2135
470p
3125
1K0
LOZ
OSCILLATOR
GND_A
3115
1K0
7128
BC856B
3143
1K0
G1
7118
74LV14D
7119
MMBTA42
3133
5K6
3146
1K5
3134
330R
3107
1K5
2126
100p
3142
1K2
6111
BAS316
7131
BC846B
3127
10K
-41,8V
-42,4V
F102
+VL
7115
BC817-25W
3122
15K
3121
4K7
3120
4K7
3156
10R
2132
1u0
6108
BZX384-C6V8
2111
1u0
Supply Low-Side Driver
-40,7V
-VL
6113
BAV99 COL
2121
1u0
-43V
-VL2
33,3V
7133
BC817-25W
3135
100R
H1
7121
STP14NF12FP
7113
BC807-25W
Short Circuit Protection
7117
MMBTA42
3129
1K0
F112
-42,8V
-42,9V
2118
1n0
3130
0R033
2130
100n
2136
100n
2124
220u
2139
330u
5103
BEAD 90MHz
2128
100n
-AMP
EVM
V
...V
DC voltages measured in Tuner mode
for wave forms see chapter 11-2 Service Hints
Combi board P2003 150W class D. 05.12.03

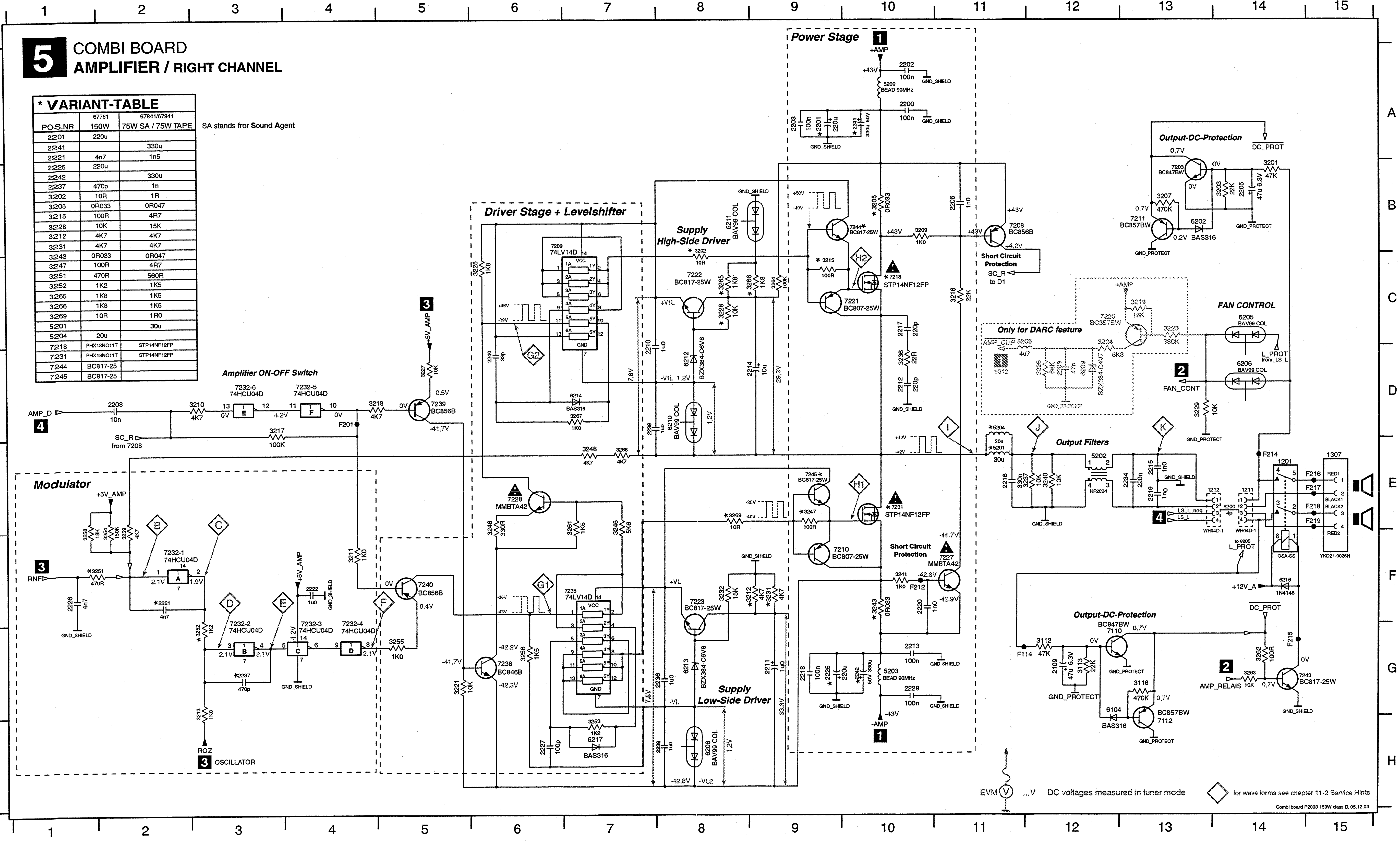
1201	F14
1211	E14
1212	E14
1307-A	E15
1307-B	E15
1307-C	E15
1307-D	F15
2109	G12
2200	A10
2201	A9
2202	A10
2203	A9
2205	B14
2206	B11
2208	D2
2209	D12
2210	D7
2211	G9
2212	D10
2213	G10
2214	D9
2215	E13
2216	E11
2217	C1
2218	G9
2219	E13
2220	F10
2221	F2
2222	F3
2225	G9
2226	F1
2227	H60
2229	G10
2234	E13
2236	G8
2237	G3
2238	H8
2239	D7
2240	D60
2241	A10
2242	G10
3112	G12
3113	G12
3116	G13
3201	B1
3202	B8
3203	B14
3205	B10
3207	B13
3209	B10
3210	D3
3211	F4
3212	F9
3213	G3
3215	C9
3216	C11
3217	D3
3218	D4
3219	C13
3221	G5
3223	C13
3224	C12
3225	C6
3226	D12
3227	D5
3228	C8
3229	D13
3231	F9
3232	F8
3236	D10
3237	E11
3240	E12
3241	F10
3243	F10
3245	E7
3246	E6
3247	E9
3248	E7
3251	F1
3252	G3
3253	H7
3254	F2
3255	G5
3256	G6
3258	F1
3259	F2
3261	E7
3262	G14
3263	G13
3264	C9
3265	C8
3266	C9
3267	D7
3268	E7
3269	E8
5200	A10
5201	E11
5202	E12
5203	G10
5204	D11
5205	C11
6104	G12
6202	B13
6205	C14
6206	D14
6208	H8
6209	D12
6210	D8
6211	B8
6212	D8
6213	G8
6214	D7
6216	F14
6217	H7
7110	G12
7112	G13
7203	B13
7208	B11
7209	B6
7210	F9
7211	B13
7218	C12
7220	C10
7221	C10
7222	C8
7223	F8
7227	F11
7228	E6
7231	E10
7232-1	F2
7232-2	G3
7232-3	G4
7232-4	G4
7232-5	D4
7232-6	D3
7235	F7
7238	G6
7239	D5
7240	F5
7243	G14
7244	B10
7245	E9
F201	D4
F212	F10
F214	E14
F215	G14
F216	E15
F217	E15
F218	E15
F219	E15

5 COMBI BOARD
AMPLIFIER / RIGHT CHANNEL

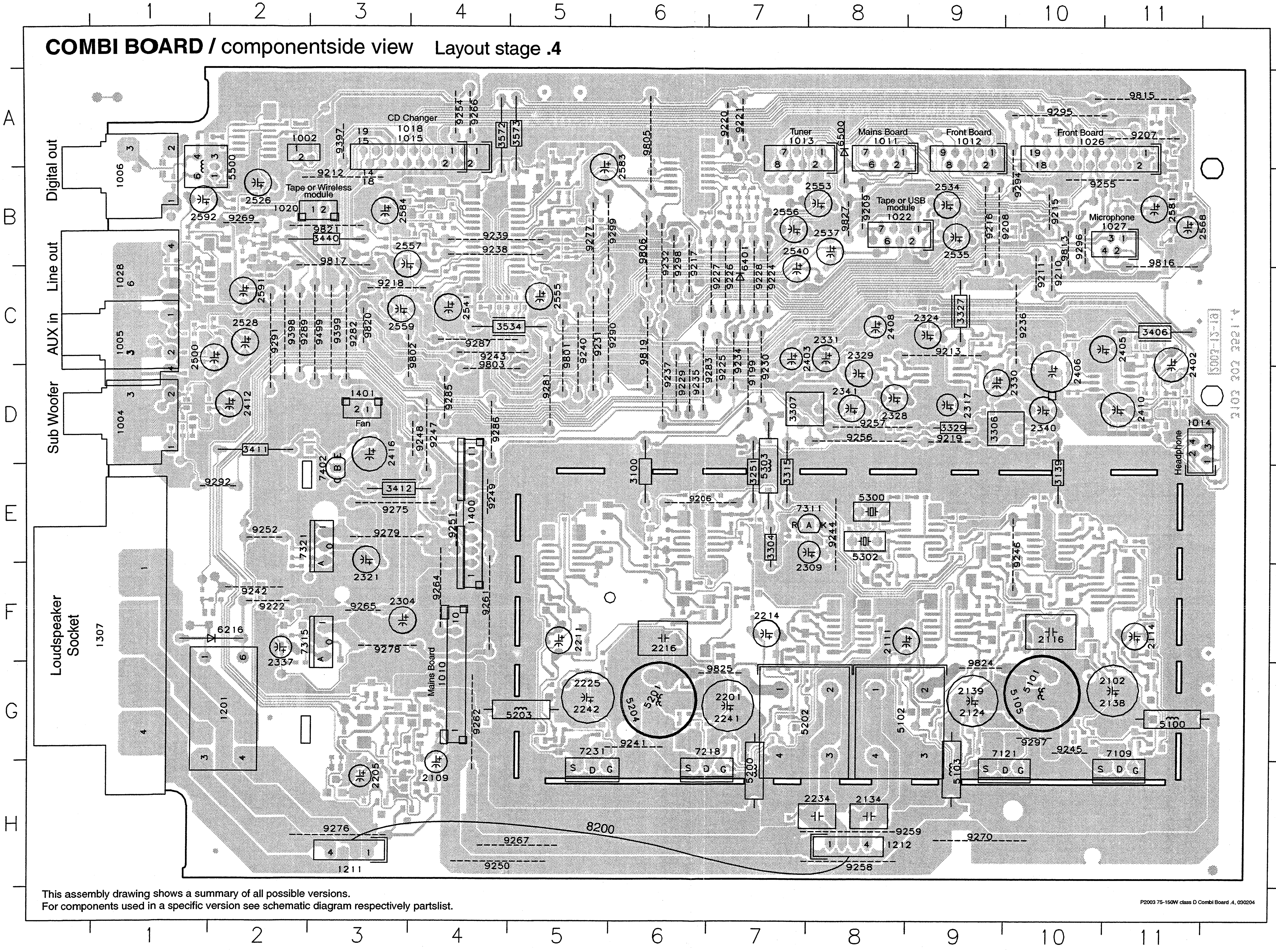
*** VARIANT-TABLE**

	67781	67841/67941
POS.NR	150W	75W SA / 75W TAPE
2201	220u	
2241		330u
2221	4n7	1n5
2225	220u	
2242		330u
2237	470p	1n
3202	10R	1R
3205	0R033	0R047
3215	100R	4R7
3228	10K	15K
3212	4K7	4K7
3231	4K7	4K7
3243	0R033	0R047
3247	100R	4R7
3251	470R	560R
3252	1K2	1K5
3265	1K8	1K5
3266	1K8	1K5
3269	10R	1R0
5201		30u
5204	20u	
7218	PHX18NQ11T	STP14NF12FP
7231	PHX18NQ11T	STP14NF12FP
7244	BC817-25	
7245	BC817-25	

SA stands for Sound Agent


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
Amplifier ON-OFF Switch
AMP_D
4
2208
10n
3210
4K7
7232-6
74HCU04D
7232-5
74HCU04D
SC_R
from 7208
3217
100K
3218
4K7
F201
+5V_AMP
3227
10K
7239
BC856B
Modulator
+5V_AMP
3
RNF
3251
470R
7232-1
74HCU04D
2221
4n7
2226
4n7
GND_SHIELD
7232-2
74HCU04D
7232-3
74HCU04D
7232-4
74HCU04D
2237
470p
2222
1u0
3252
1K2
3213
1K0
ROZ
3 OSCILLATOR
3211
1K0
7240
BC856B
3255
1K0
Driver Stage + Levelshifter
7209
74LV14D
G2
6214
BAS316
3267
1K0
3248
4K7
3268
4K7
7228
MMBTA42
3246
330R
3261
1K5
3245
5K6
G1
7235
74LV14D
7238
BC846B
3221
10K
3256
1K5
3253
1K2
6217
BAS316
2227
100p
Supply
High-Side Driver
3202
10R
7222
BC817-25W
6211
BAV99 COL
6212
BZX384-C6V8
6210
BAV99 COL
+V1L
-V1L
7223
BC817-25W
6213
BZX384-C6V8
6208
BAV99 COL
+VL
-VL
-VL2
Supply
Low-Side Driver
Power Stage
1
+AMP
2202
100n
5200
BEAD 90MHz
2200
100n
2203
2201
2241
GND_SHIELD
7244
BC817-25W
3205
0R033
3215
100R
H2
7218
STP14NF12FP
7221
BC807-25W
3209
1K0
7208
BC856B
Short Circuit Protection
SC_R
to D1
2206
1n0
3216
22K
2217
220p
3238
22R
2212
220p
I
7245
BC817-25W
3269
10R
3247
100R
H1
7231
STP14NF12FP
7210
BC807-25W
Short Circuit Protection
7227
MMBTA42
3241
1K0
F212
3243
0R033
2220
1n0
2213
100n
5203
BEAD 90MHz
2229
100n
2218
2225
2242
-AMP
1
Only for DARC feature
AMP_CLIP
5205
4u7
1012
7220
BC857BW
3219
18K
3223
330K
3224
6K8
GND_PROTECT
5204
20u
5201
30u
J
Output Filters
5202
HF2024
K
2216
3237
3240
2234
2215
1n0
2219
1n0
1212
1211
8200
4p
WH04D-1
LS_L_neg
LS_L
4
F214
1201
1307
F216
F217
F218
F219
RED1
BLACK1
BLACK2
RED2
OSA-SS
YKD21-0026N
Output-DC-Protection
DC_PROT
7203
BC847BW
3201
47K
3203
22K
2205
47u 6.3V
7211
BC857BW
3207
470K
6202
BAS316
GND_PROTECT
FAN CONTROL
6205
BAV99 COL
6206
BAV99 COL
L_PROT
from_LS_L
2
FAN_CONT
3229
10K
to 6205
L_PROT
6216
1N4148
+12V_A
Output-DC-Protection
BC847BW
7110
F114
3112
47K
2109
47u 6.3V
3113
22K
GND_PROTECT
3116
470K
6104
BAS316
BC857BW
7112
DC_PROT
3262
100R
F215
2
AMP_RELAIS
3263
10K
7243
BC817-25W
GND_SHIELD
EVM
V
...V DC voltages measured in tuner mode
for wave forms see chapter 11-2 Service Hints
Combi board P2003 150W class D, 05.12.03

COMBI BOARD / componentside view Layout stage **.4**


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
Digital out
1006
5500
Line out
1028
AUX in
1005
Sub Woofer
1004
Loudspeaker Socket
1307
1201
6216
CD Changer
1018
1015
1002
Tape or Wireless module
1020
Fan
1401
1400
Mains Board
1010
Tuner
1013
6500
Mains Board
1011
Front Board
1012
Front Board
1026
Tape or USB module
1022
Microphone
1027
Headphone
1014
7402
7321
7315
7311
7231
7218
7121
7109
5201
5101
5202
5102
5200
5303
5100
5203
5300
5302
1211
1212
8200

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

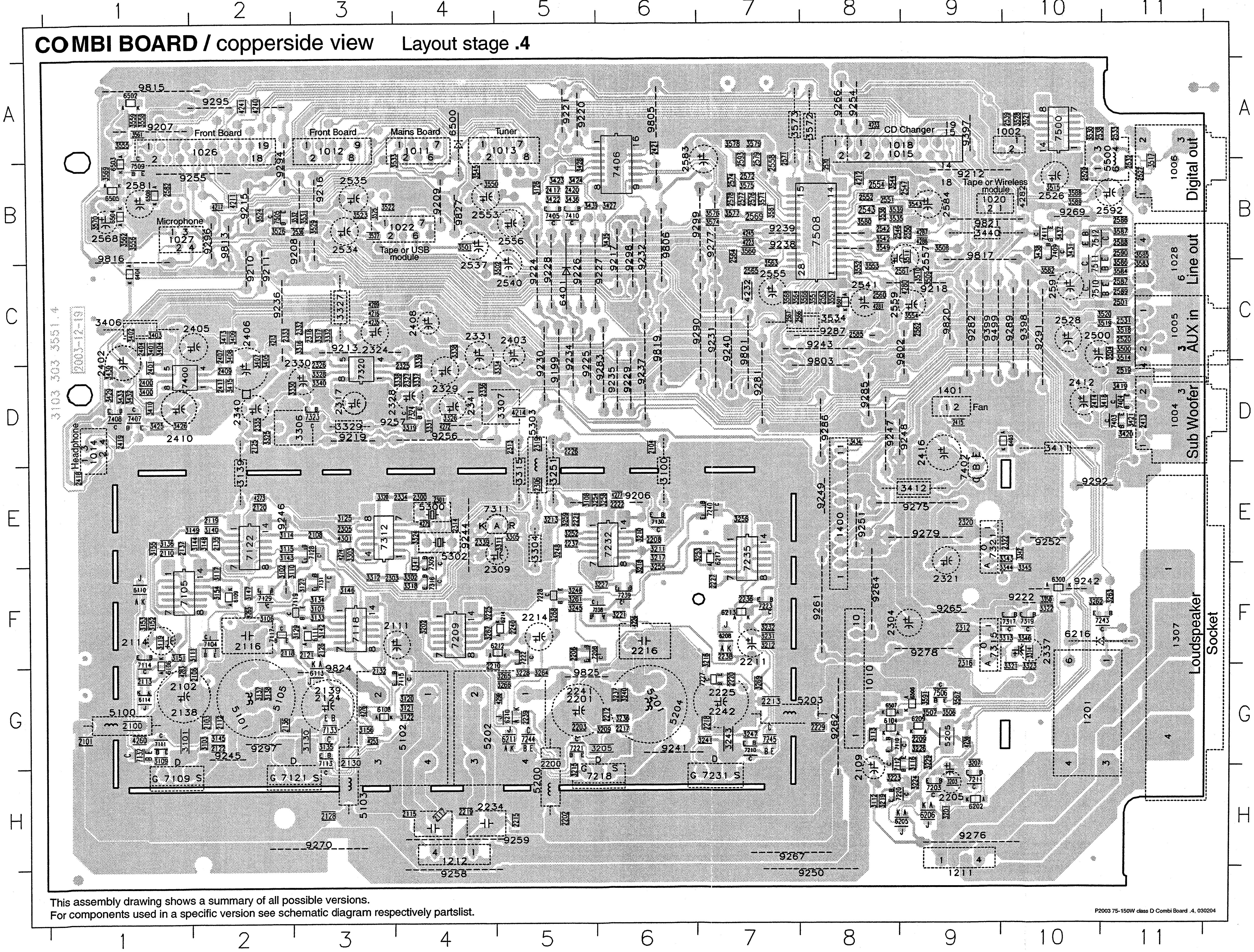
P2003 75-150W class D Combi Board .4, 030204

1002	A2
1004	D1
1005	C1
1006	B1
1010	G4
1011	A8
1012	A9
1013	A7
1014	D11
1015	A3
1018	A3
1020	B3
1022	B8
1026	A10
1027	B11
1028	C1
1201	G2
1211	H3
1212	H8
1307	F1
1400	E4
1401	D3
2102	G11
2109	H4
2111	F8
2114	F11
2116	F10
2124	G9
2134	H8
2138	G11
2139	G9
2201	G7
2205	H3
2211	F5
2214	F7
2216	F6
2225	G5
2234	H8
2241	G7
2242	G5
2304	F3
2309	F8
2317	D9
2321	F3
2324	C9
2328	D8
2329	C8
2330	D10
2331	C8
2337	G2
2340	D10
2341	D8
2402	C11
2403	C7
2405	C11
2406	D10
2408	C8
2410	D11
2412	D2
2416	D3
2500	C1
2526	B2
2528	C2
2534	B9
2535	B9
2537	B8
2540	C8
2541	C4
2553	B8
2555	C5
2556	B7
2557	B3
2559	C3
2568	B11
2581	B11
2583	A6
2584	B3
2591	C2
2592	B1
3100	E6
3139	E10
3251	E7
3304	E7
3306	D9
3307	D7
3315	E7
3327	C9
3329	D9
3406	C11
3411	D2
3412	E3
3440	B3
3534	C4
3572	A4
3573	A5
5100	G11
5101	G10
5102	G8
5103	H9
5105	G10
5200	H7
5201	G6
5202	G7
5203	G5
5204	G6
5300	E8
5302	E8
5303	E7
5500	B2
6216	F2
6401	B7
6500	A8
7109	G11
7121	G10
7218	G6
7231	G5
7311	E8
7315	F2
7321	E2
7402	E3
8200	H5
9199	D7
9206	E6
9207	A11
9208	B9
9209	B8
9210	C10
9211	C10
9212	B3
9213	C9
9215	B10
9216	B9
9217	B6
9218	C3
9219	D9
9220	A7
9221	A7
9222	F2
9224	C7
9225	D7
9226	C7
9227	C7
9228	C7
9229	D6
9230	D7
9231	C5
9232	B6
9234	C7
9235	D6
9236	C10
9237	D6
9238	B4
9239	B4
9240	C5
9241	G6
9242	F2
9243	C4
9244	E8
9245	G10
9246	E10
9247	D4
9248	D4
9249	E4
9250	H4
9251	E4
9252	E2
9254	A4
9255	B10
9256	D8
9257	D8
9258	H8
9259	H8
9261	F4
9262	G4
9264	F4
9265	F3
9266	A4
9267	H5
9269	B2
9270	H9
9275	E3
9276	H3
9277	B5
9278	F3
9279	E3
9281	D5
9282	C3
9283	D6
9285	D4
9286	D4
9287	C4
9289	C2
9290	C6
9291	C2
9292	E2
9294	B10
9295	A10
9296	B10
9297	G10
9298	B6
9299	B6
9397	A3
9398	C2
9399	C3
9499	C3
9801	C5
9802	C4
9803	D4
9805	A6
9806	B6
9813	B10
9815	A11
9816	B11
9817	B3
9819	C6
9820	C3
9821	B3
9824	G9
9825	G7
9827	B8

1002 A9	1013 A5	1027 B1	1401 D9	2134 H4	2216 F6	2317 D3	2337 F10	2408 C4	2534 B3	2556 B5	2591 C10	3307 D5	3440 B9	5103 H3	5300 E4
1004 D11	1014 D1	1028 C11	2102 G1	2138 G1	2225 G7	2321 F9	2340 D2	2410 D1	2535 B3	2557 B9	2592 B11	3315 E5	3534 C8	5105 G2	5302 E4
1005 C11	1015 A8	1201 G10	2109 H8	2139 G3	2234 H4	2324 C3	2341 D4	2412 D10	2537 B4	2559 C8	3100 E6	3327 C3	3572 A8	5200 H5	5303 D5
1006 B11	1018 A9	1211 H9	2111 F3	2201 G5	2241 G5	2328 D3	2402 C1	2416 D9	2540 C5	2568 B1	3139 E2	3329 D3	3573 A7	5201 G6	5500 B11
1010 G8	1020 B9	1212 H4	2114 F1	2205 H9	2242 G7	2329 D4	2403 C5	2500 C10	2541 C8	2581 B1	3251 E5	3406 C1	5100 G1	5202 G5	6216 F10
1011 A4	1022 B4	1307 F11	2116 F2	2211 F7	2304 F8	2330 D2	2405 C2	2526 B10	2553 B4	2583 A6	3304 E5	3411 D10	5101 G2	5203 G8	6401 C5
1012 A3	1026 A2	1400 E8	2124 G3	2214 F5	2309 E4	2331 C4	2406 C2	2528 C10	2555 C7	2584 B9	3306 D3	3412 E9	5102 G4	5204 G6	6500 A4

7109 H1	7402 E9	9211 C2	9219 D3	9227 C6	9235 D6	9242 F10	9249 E8	9257 D3	9266 A8	9278 F9	9287 C8	9296 B2	9499 C9	9815 A1	9825 G5
7121 H2	9199 D5	9212 B9	9220 A5	9228 C5	9236 C2	9243 C8	9250 H8	9258 H4	9267 H7	9279 E9	9289 C10	9297 G2	9801 C7	9816 B1	9827 B4
7218 H6	9206 E6	9213 C3	9221 A5	9229 D6	9237 D6	9244 E4	9251 E8	9259 H4	9269 B10	9281 D7	9290 C6	9298 B6	9802 C8	9817 B9	
7231 H7	9207 A1	9215 B2	9222 F10	9230 D5	9238 B8	9245 G2	9252 E10	9261 F8	9270 H3	9282 C9	9291 C10	9299 B6	9803 D8	9819 C6	
7311 E4	9208 B3	9216 B3	9224 C5	9231 C7	9239 B8	9246 E2	9254 A8	9262 G8	9275 E9	9283 D6	9292 E10	9397 A9	9805 A6	9820 C9	
7315 F9	9209 B4	9217 B6	9225 D5	9232 B6	9240 C7	9247 D8	9255 B2	9264 F8	9276 H9	9285 D8	9294 B2	9398 C10	9806 B6	9821 B9	
7321 E9	9210 C2	9218 C9	9226 C5	9234 C5	9241 G6	9248 D9	9256 D4	9265 F9	9277 B7	9286 D8	9295 A2	9399 C9	9813 B2	9824 F3	

COMBI BOARD / copperside view Layout stage **.4**

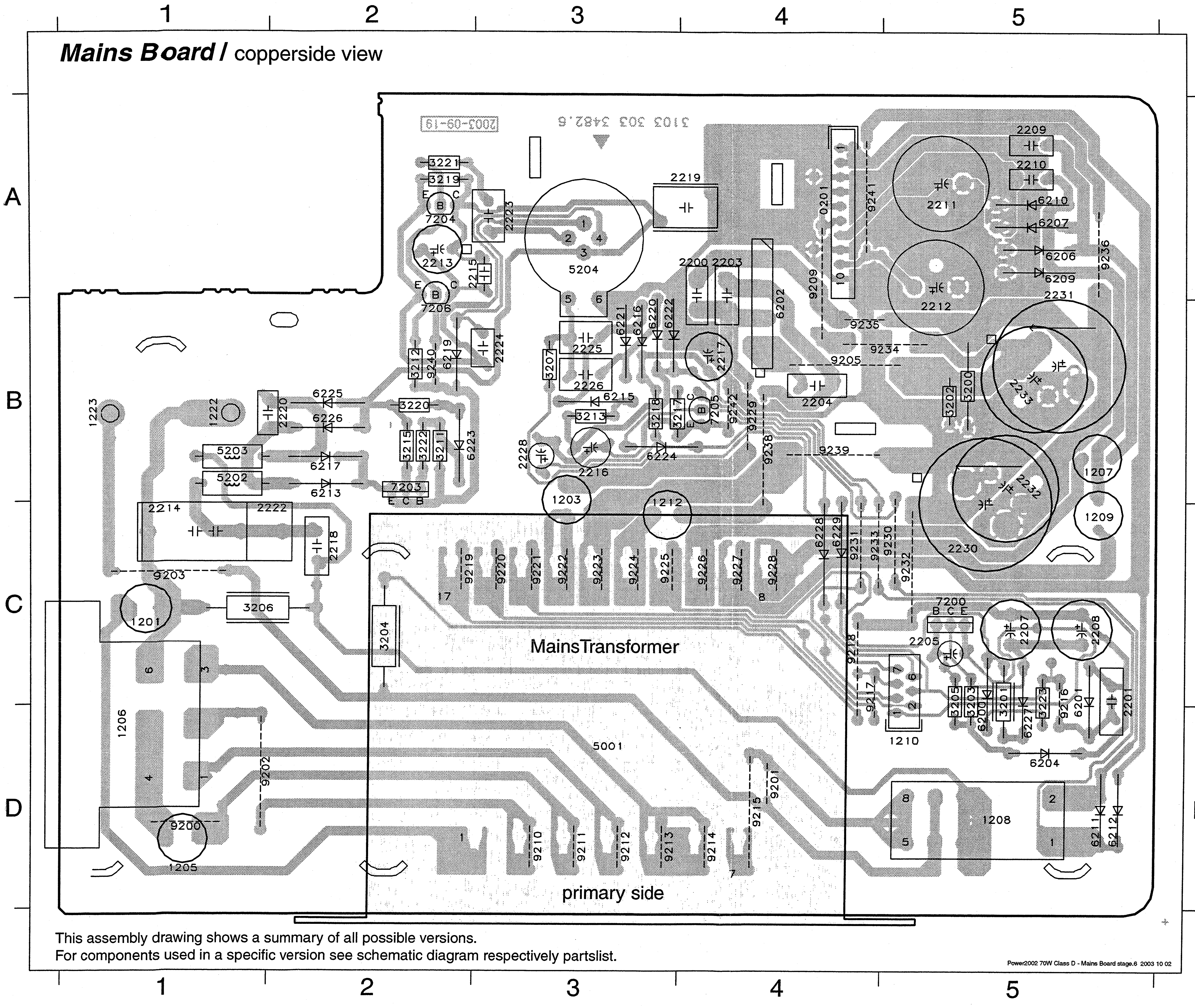


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

P2003 75-150W class D Combi Board .4. 030204

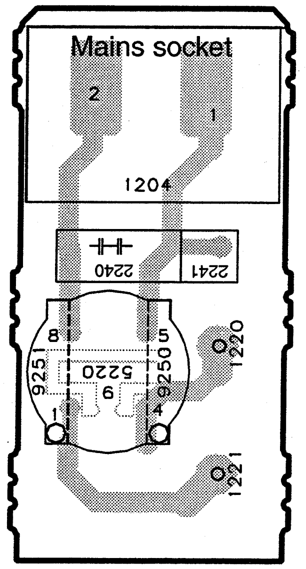
2100 G1	2587 C11	3337 D4	4216 C3
2101 G1	2588 B11	3338 C4	4217 B2
2103 G2	2589 C11	3339 C4	4223 B7
2104 D6	2590 B11	3340 D3	4226 F6
2106 G2	2593 B7	3341 F4	4230 G9
2108 E3	3101 G1	3342 E10	4232 C7
2110 E1	3102 F2	3343 E10	4233 A8
2112 G2	3103 G2	3344 F10	4235 C3
2113 G1	3106 F2	3345 F10	4240 A2
2115 H4	3107 F3	3346 F10	4241 A2
2117 H4	3108 E5	3350 F10	4245 B7
2118 F2	3109 G1	3400 D1	4253 G3
2119 E2	3110 F2	3401 C1	4260 G1
2120 E2	3111 F1	3402 C1	4265 F2
2121 F3	3112 H8	3403 C1	4272 D4
2122 G2	3113 G8	3404 C1	4273 E2
2125 D2	3114 E2	3405 C2	4274 E3
2126 F3	3115 E2	3407 C2	4276 G3
2128 H3	3116 G9	3408 C2	4277 E6
2130 G3	3117 F2	3409 C2	4279 E4
2132 G3	3119 F1	3410 D1	4280 C9
2135 E2	3120 G4	3413 C2	4281 C8
2136 G2	3121 G4	3415 D2	4282 B10
2137 E1	3122 G4	3418 D11	4283 G1
2200 H5	3125 E3	3419 D11	4286 B9
2202 H5	3126 B5	3420 D11	4287 B9
2203 G5	3127 F3	3421 D11	4289 C3
2206 F5	3129 F3	3422 B5	4290 G5
2208 E6	3130 G3	3423 B5	4301 E3
2209 G9	3133 F3	3424 B5	5205 G9
2210 G4	3134 F3	3425 D1	6104 G8
2212 G6	3135 G3	3426 D1	6106 F1
2213 G7	3136 E1	3427 B6	6108 G3
2215 H5	3137 G2	3428 B5	6109 F2
2217 G6	3138 G2	3429 D1	6110 F1
2218 G7	3140 E2	3430 D1	6111 F3
2219 H4	3142 F3	3431 B10	6113 G3
2220 G7	3143 E2	3432 D1	6114 G1
2221 E5	3144 E2	3433 D1	6202 H9
2222 E6	3145 G2	3434 D8	6205 H8
2226 D5	3146 F3	3435 B6	6206 H9
2227 F7	3147 F2	3436 B5	6208 F7
2229 G8	3148 E2	3437 B10	6209 G9
2236 F7	3149 E1	3438 B10	6210 G5
2237 E5	3151 F1	3439 B5	6211 G5
2238 F7	3152 F1	3500 C11	6212 F4
2239 G5	3153 F1	3501 B4	6213 F7
2240 F5	3154 F2	3502 C5	6214 F4
2300 E4	3155 E1	3504 C11	6217 E7
2301 E4	3156 G3	3506 G9	6300 F10
2303 F3	3201 H9	3507 G9	6403 D10
2305 E3	3202 F4	3508 B9	6404 C1
2306 E5	3203 H9	3509 C9	6501 C8
2312 F9	3205 G6	3510 C9	6502 A1
2313 D5	3207 G9	3511 B9	6503 A1
2314 E4	3209 G6	3514 C11	6504 B1
2316 F9	3210 E6	3515 B10	6505 B1
2318 C3	3211 E6	3517 B11	6506 G9
2319 D5	3212 F7	3518 C11	6507 G8
2320 E9	3213 E5	3519 C11	6508 B1
2322 E10	3215 H5	3520 C11	7104 F2
2325 D4	3216 F7	3521 A10	7105 F1
2326 D3	3217 E6	3522 B3	7110 G8
2327 D4	3218 F6	3523 B3	7111 G1
2332 C3	3219 H8	3524 B2	7112 G8
2333 C2	3221 F6	3525 B3	7113 G3
2334 E4	3223 H8	3526 B2	7114 F1
2335 D2	3224 H9	3527 B3	7115 G4
2336 D4	3225 F4	3528 A10	7117 F2
2339 E4	3226 G9	3529 B3	7118 F3
2400 D1	3227 F6	3530 A10	7119 F3
2401 D1	3228 G5	3531 B3	7122 E2
2404 C1	3229 G9	3532 B3	7128 E3
2407 C2	3231 F7	3533 B4	7129 F2
2409 D2	3232 F7	3535 B8	7130 E6
2411 D2	3236 G6	3536 B8	7131 F3
2413 D11	3237 G6	3539 B8	7132 G1
2414 D10	3240 G6	3542 B8	7133 G3
2415 D9	3241 G7	3543 B9	7203 H9
2417 B5	3243 G7	3544 B8	7208 F5
2418 E1	3245 F5	3545 B4	7209 F4
2419 D1	3246 F5	3549 B8	7210 G7
2420 B5	3247 G7	3550 B4	7211 H9
2421 A6	3248 E5	3551 C8	7220 H8
2501 C11	3252 E5	3552 C8	7221 G5
2519 D11	3253 E6	3553 C8	7222 F5
2520 C11	3254 E5	3554 C9	7223 F7
2527 B11	3255 F6	3555 A1	7227 G7
2529 B10	3256 E7	3556 B1	7228 F5
2531 C11	3258 E6	3557 C8	7232 E6
2532 B11	3259 E5	3558 A1	7235 E7
2533 A11	3261 F5	3559 A1	7238 F5
2536 B3	3262 F10	3560 B7	7239 F6
2538 A10	3263 F11	3561 A1	7240 E7
2539 A10	3264 G5	3562 B1	7243 F10
2542 B8	3265 G5	3563 C7	7244 G5
2543 B8	3266 G5	3564 C7	7245 G7
2546 B8	3267 F4	3566 C8	7309 E4
2547 B9	3268 F5	3567 G9	7312 E3
2550 B9	3269 G7	3568 C7	7316 F4
2551 B8	3302 F4	3569 B1	7317 F10
2552 B8	3303 E3	3570 B1	7319 F10
2554 B8	3305 E5	3571 B7	7320 D3
2558 B7	3311 E5	3574 B7	7323 D3
2560 C8	3312 F3	3575 B7	7324 D4
2561 C9	3313 F10	3576 B7	7400 D1
2562 C9	3314 F10	3577 B7	7403 D11
2563 C8	3316 C3	3578 A7	7404 D11
2564 B7	3317 C3	3579 A7	7405 B5
2565 C7	3318 F4	3580 B8	7406 B6
2566 C7	3319 D4	3581 B7	7407 D1
2567 C7	3320 E3	3582 C10	7408 D1
2569 B7	3321 G10	3583 C11	7409 B10
2570 B8	3322 F10	3584 C11	7410 B5
2571 A7	3323 G10	3585 B11	7411 B10
2572 B7	3324 E4	3586 C11	7500 A10
2574 B7	3325 D2	3587 B11	7505 B2
2576 B7	3326 D4	3588 B10	7506 G9
2577 B7	3328 D3	3589 B10	7508 B8
2578 B7	3330 D2	3591 G9	7509 B1
2579 B7	3331 D4	4211 B2	7510 C10
2582 B1	3332 C3	4212 B8	7511 C10
2585 C8	3334 D5	4213 C2	7512 B10
2586 B11	3336 D4	4214 D5	

Mains Board / copperside view


1
2
3
4
5
A
B
C
D
2003-09-19
3103 303 3482.6
MainsTransformer
primary side
5001
5204
1206
1208
1210
1201
1203
1205
1207
1209
1212
1222
1223
0201
2211
2212
2230
2231
2232
2233
7200
7203
7204
7205
7206

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

Power2002 70W Class D - Mains Board stage.6 2003 10 02


Mains socket
1204
2240
2241
5220
9250
9251
1220
1221

0201	A4
1201	C1
1203	B3
1205	D1
1206	D1
1207	B5
1208	D5
1209	C5
1210	C5
1212	C4
1222	B1
1223	B1
2200	A4
2201	D5
2203	A4
2204	B4
2205	C5
2207	C5
2208	C5
2209	A5
2210	A5
2211	A5
2212	A4
2213	A2
2214	B1
2215	A3
2216	B3
2217	B4
2218	C2
2219	A4
2220	B1
2222	C1
2223	A3
2224	B3
2225	B3
2226	B3
2228	B3
2230	C5
2231	B5
2232	B5
2233	B5
3200	B5
3201	D5
3202	B5
3203	D5
3204	C2
3205	D5
3206	C1
3207	B3
3211	B2
3212	B2
3213	B3
3215	B2
3217	B4
3218	B3
3219	A3
3220	B2
3221	A2
3222	B2
3223	C5
5001	C3
5202	B1
5203	B1
5204	A3
6200	D5
6201	D5
6202	B4
6204	D5
6206	A5
6207	A5
6209	A5
6210	A5
6211	D5
6212	D5
6213	B2
6215	B3
6216	B3
6217	B2
6219	B2
6220	A3
6221	B3
6222	A3
6223	B2
6224	B3
6225	B2
6226	B2
6227	C5
6228	C4
6229	C4
7200	C5
7203	C2
7204	A2
7205	B4
7206	A2
9200	D1
9201	D4
9202	D1
9203	C1
9205	B4
9209	A4
9210	D3
9211	D3
9212	D3
9213	D3
9214	D4
9215	D4
9216	C5
9217	C4
9218	C4
9219	C2
9220	C3
9221	C3
9222	C3
9223	C3
9224	C3
9225	C4
9226	C4
9227	C4
9228	C4
9229	B4
9230	C5
9231	C4
9232	C5
9233	C5
9234	B5
9235	B4
9236	A5
9238	B4
9239	B4
9240	B2
9241	A4
9242	B4

0201 D10
1201 A3
1203 A5
1205 A3
1206 A3

1207 B5
1208 C3
1209 C5
1210 C10
1212 B5

1222 A2
1223 A2
2200 A6
2201 C8
2203 A6

2204 A6
2205 A10
2207 B8
2208 B9
2209 C6

2210 C7
2211 C7
2212 B7
2213 D4
2214 D1

2215 D5
2216 E8
2217 E9
2218 E1
2219 E7

2220 E1
2222 D1
2223 D6
2224 E6
2225 C8

2226 D7
2228 C1
2230 A7
2231 B7
2232 A7

2233 A7
2240 A1
3200 A8
3201 B8
3202 A8

3203 B9
3204 A2
3205 B9
3206 B2
3207 C8

3211 D4
3212 D5
3213 D8
3215 E3
3217 C2

3218 B1
3219 E6
3220 E4
3221 D6
3222 E3

3223 B8
5001 A4
5202 E1
5203 E1
5204 D7

6200 B8
6201 C9
6202 A6
6204 B9
6206 C6

6207 C7
6209 C6
6210 C7
6211 C3
6212 C3

6213 D2
6215 D8
6216 D9
6217 D2
6219 D6

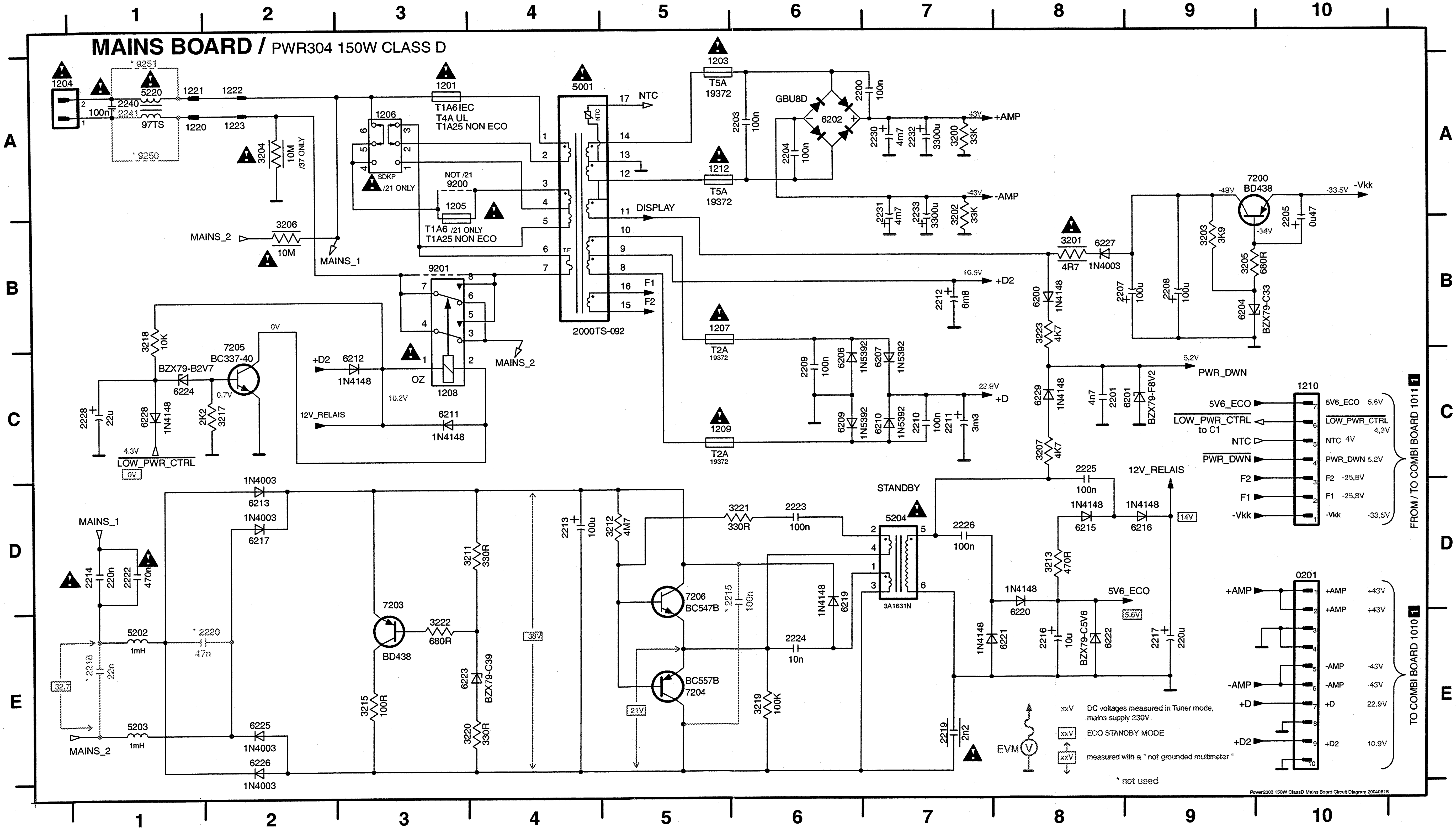
6220 D8
6221 E8
6222 E8
6223 E3
6224 C1

6225 E2
6226 E2
6227 B8
6228 C1
6229 C8

7200 A9
7203 D3
7204 E5
7205 B2
7206 D5

9200 A3
9201 B3
9250 A1
9251 A1

MAINS BOARD / PWR304 150W CLASS D


1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
1204
* 9251
5220
97TS
2240
100n
2241
* 9250
1221
1222
1220
1223
3204
10M
/37 ONLY
1201
T1A6IEC
T4A UL
T1A25 NON ECO
1206
SDKP
/21 ONLY
NOT /21
9200
1205
T1A6 /21 ONLY
T1A25 NON ECO
MAINS_2
3206
10M
MAINS_1
9201
5001
NTC
17
14
13
12
11
10
9
8
16
15
DISPLAY
F1
F2
T.F
2000TS-092
1203
T5A
19372
2203
100n
GBU8D
6202
2200
100n
2204
100n
1212
T5A
19372
2230
4m7
2232
3300u
3200
33K
43V
+AMP
2231
4m7
2233
3300u
3202
33K
-43V
-AMP
7200
BD438
-49V
-33.5V
-Vkk
-34V
3203
3K9
2205
0u47
3205
680R
6204
BZX79-C33
3201
4R7
6227
1N4003
6200
1N4148
2207
100u
2208
100u
10.9V
+D2
2212
6m8
3223
4K7
5.2V
PWR_DWN
1207
T2A
19372
2209
100n
6206
1N5392
6207
1N5392
6209
1N5392
6210
1N5392
2210
100n
2211
3m3
22.9V
+D
1209
T2A
19372
6229
1N4148
4n7
2201
6201
BZX79-F8V2
3207
4K7
3218
10K
7205
BC337-40
0V
BZX79-B2V7
6224
0.7V
2228
22u
6228
1N4148
2K2
3217
4.3V
LOW_PWR_CTRL
0V
+D2
6212
1N4148
10.2V
OZ
1208
12V_RELAIS
6211
1N4148
MAINS_2
1210
5V6_ECO
LOW_PWR_CTRL
to C1
NTC
PWR_DWN
F2
F1
-Vkk
5V6_ECO 5,6V
LOW_PWR_CTRL 4,3V
NTC 4V
PWR_DWN 5,2V
F2 -25,8V
F1 -25,8V
-Vkk -33,5V
FROM / TO COMBI BOARD 1011
1N4003
6213
1N4003
6217
MAINS_1
2214
220n
2222
470n
5202
1mH
* 2220
47n
* 2218
22n
32,7
5203
1mH
MAINS_2
6225
1N4003
6226
1N4003
7203
BD438
3222
680R
3215
100R
3211
330R
6223
BZX79-C39
3220
330R
38V
2213
100u
3212
4M7
7206
BC547B
* 2215
100n
BC557B
7204
21V
3221
330R
2223
100n
STANDBY
5204
3A1631N
6219
1N4148
2224
10n
3219
100K
2225
100n
12V_RELAIS
1N4148
6215
1N4148
6216
14V
2226
100n
3213
470R
1N4148
6220
5V6_ECO
5.6V
6221
1N4148
2216
10u
BZX79-C5V6
6222
2217
220u
2219
2n2
EVM
xxV DC voltages measured in Tuner mode, mains supply 230V
xxV ECO STANDBY MODE
xxV measured with a " not grounded multimeter "
* not used
0201
+AMP
+AMP +43V
+AMP +43V
-AMP -43V
-AMP -43V
-AMP
+D
+D 22.9V
+D2
+D2 10.9V
TO COMBI BOARD 1010
Power2003 150W ClassD Mains Board Circuit Diagram 20040615

ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***MAINS BOARD***

MISCELLANEOUS

1201 ▲	**4822 071 51602**	**FUSE 1,6A**	/21/22 only
1201 ▲	**4822 253 10126**	**FUSE T4A**	/37 only
1203 ▲	**4822 071 55002**	**FUSE T5A**	/21/22 only
1204 ▲	**2422 030 00328**	**MAINS SOCKET /37**	
1204 ▲	**4822 265 31015**	**MAINS SOCKET, IEC**	
1205 ▲	**4822 071 51602**	**FUSE 1,6A**	/21 only
1206 ▲	**2422 129 16478**	**VOLTAGE SELECTOR**	/21 only
1207 ▲	**9965 000 07788**	**FUSE RAD T2A**	
1208 ▲	**2422 132 07519**	**RELAY 1P 12V 16A**	
1209 ▲	**9965 000 07788**	**FUSE RAD T2A**	
1210	4822 267 10953	FFC-CONNECTOR, 7P, TOP ENTRY	
1212 ▲	**4822 071 55002**	**FUSE T5A**	
5001 ▲	**3103 308 30870**	**Mains Transformer /37**	for 75W only
5001 ▲	**3103 308 30880**	**Mains Transformer /22**	for 75W only
5001 ▲	**3103 308 30890**	**Mains Transformer /21, /21M**	for 75W only
5001 ▲	**3103 308 31011**	**Mains Transformer /37**	for 150W only
5001 ▲	**3103 308 31001**	**Mains Transformer /22**	for 150W only
5001 ▲	**3103 308 30991**	**Mains Transformer /21, /21M**	for 150W only
5204 ▲	**2422 549 45157**	**STANDBY TRANSFORMER**	

CAPACITORS

2200	4822 121 43696	100nF	10%	100V	
2201	4822 122 31125	4,7nF	10%	63V	
2203	4822 121 43696	100nF	10%	100V	
2204	4822 121 43696	100nF	10%	100V	
2205	5322 124 41948	0,47µF	20%	50V	
2208	2020 012 93547	100µF	20%	63V	
2209	5322 121 42386	100nF	5%	63V	
2210	5322 121 42386	100nF	5%	63V	
2211	4822 124 42367	3300µF	20%	35V	
2212	4822 124 12328	6800µF	20%	16V	
2213	4822 124 40255	100µF	20%	50V	
2214 ▲	**4822 121 10512**	**220nF**	**20%**	**275V**	/22 only
2216	4822 124 21732	10µF	20%	25V	
2217	4822 124 80144	220µF	20%	25V	
2219 ▲	**4822 126 14088**	**2,2nF**	**20%**	**250V**	
2222 ▲	**4822 126 13589**	**470nF**	**10%**	**275V**	/21/37 only
2223	5322 121 42386	100nF	5%	63V	
2224	4822 122 30043	10nF	80%	63V	
2225	5322 121 42386	100nF	5%	63V	
2226	5322 121 42386	100nF	5%	63V	
2228 ©	4822 124 11946	22µF	20%	16V	
2232	2022 020 00644	3300µF	20%	50V	
2233	2022 020 00644	3300µF	20%	50V	
2240 ▲	**2022 330 00014**	**100nF**	**20%**	**275V**	

RESISTORS

3200	4822 050 23303	33kΩ	1%	0,6W	
3201 ▲	**4822 052 10478**	**4,7Ω**	**5%**	**0,5W**	NFR
3202	4822 050 23303	33kΩ	1%	0,6W	
3203	4822 116 52276	3,9kΩ	5%	0,5W	
3204 ▲	**4822 053 21106**	**10MΩ**	**5%**	**0,5W**	/37 only
3205	4822 116 52228	680Ω	5%	0,5W	
3206 ▲	**4822 053 21106**	**10MΩ**	**5%**	**0,5W**	
3207	4822 116 52283	4,7kΩ	5%	0,5W	
3211	4822 116 52219	330Ω	5%	0,5W	
3212	4822 111 30893	4,7MΩ	5%	0,2W	
3213	4822 116 83883	470Ω	5%	0,16W	
3215	4822 116 52175	100Ω	5%	0,5W	
3217	4822 116 52256	2,2kΩ	5%	0,16W	
3218	4822 050 21003	10kΩ	2%	0,25W	
3219	4822 116 52234	100kΩ	5%	0,5W	
3220	4822 116 52219	330Ω	5%	0,5W	
3221	4822 116 52219	330Ω	5%	0,5W	
3222	4822 116 52228	680Ω	5%	0,5W	
3223	4822 116 52283	4,7kΩ	5%	0,5W	

COILS

5202	**4822 157 53473**	**1000µH**
5203	**4822 157 53473**	**1000µH**
5220 ▲	**4822 157 11832**	**400µH, Mains filter**

DIODES

6200	4822 130 30621	1N4148
6201	4822 130 34382	BZX79-B8V2
6202	4822 130 11139	GBU8D
6204	4822 130 34142	BZX79-B33
6206	4822 130 31878	1N4003G
6207	4822 130 31878	1N4003G
6209	4822 130 31878	1N4003G
6210	4822 130 31878	1N4003G
6211	4822 130 30621	1N4148
6212	4822 130 30621	1N4148
6213	4822 130 31878	1N4003G
6215	4822 130 30621	1N4148
6216	4822 130 30621	1N4148
6217	4822 130 31878	1N4003G
6219	4822 130 30621	1N4148
6220	4822 130 31983	BAT85
6221	4822 130 31983	BAT85
6223	4822 130 34145	BZX79-B39
6224	5322 130 34563	BZX79-C2V7
6225	4822 130 31878	1N4003G
6226	4822 130 31878	1N4003G
6227	4822 130 31878	1N4003G
6228	4822 130 30621	1N4148
6229	4822 130 30621	1N4148

TRANSISTORS

7200	**4822 130 40995**	**BD438**
7203	**4822 130 40995**	**BD438**
7204	**4822 130 44568**	**BC557B**
7205	**4822 130 40855**	**BC337-40**
7206	**4822 130 40959**	**BC547B**

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.

ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

MISCELLANEOUS

0021	4822 492 11735	SPRING TRANSISTOR
1005	2422 026 05418	SOCKET, CINCH, 2p
1011	4822 267 10953	FFC-CONNECTOR, 7P, TOP ENTRY
1012	2422 025 14518	FFC-CONNECTOR, 9P, TOP ENTRY
1013	4822 265 11515	FFC-CONNECTOR, 8P, TOP ENTRY
1014	4822 267 10733	FFC CONNECTOR, 4P, TOP ENTRY
1015	4822 265 10981	FFC-CONNECTOR, 15P, TOP ENTRY
1022	4822 267 10953	FFC-CONNECTOR, 7P, TOP ENTRY
1026	4822 265 11553	FFC-CONNECTOR, 19P, TOP ENTRY
1201	**2422 132 07517**	**RELAY 2P 12V**
1307	2422 015 19893	SOCKET, CLICKFIT, 4P

CAPACITORS

2100 ©	4822 122 33496	100nF	10%	63V	
2101 ©	2222 580 15649	100nF	10%	50V	
2102	2022 031 00196	220µF	20%	50V	for 150W only
2103 ©	2222 580 15649	100nF	10%	50V	
2104 ©	5322 126 11583	10nF	10%	63V	
2106 ©	5322 126 11578	1nF	10%	63V	
2108 ©	5322 126 11583	10nF	10%	63V	
2109	4822 124 80483	47µF	20%	6,3V	
2110 ©	3198 017 41050	1µF	20%	10V	
2111	4822 124 21913	1µF	20%	63V	
2112 ©	4822 126 13883	220pF	5%	50V	
2113 ©	3198 017 41050	1µF	20%	10V	
2114	4822 124 40248	10µF	20%	63V	
2115 ©	5322 126 11578	1nF	10%	63V	
2116	5322 121 42661	330nF	5%	63V	
2117 ©	5322 126 11578	1nF	10%	63V	
2118 ©	5322 126 11578	1nF	10%	63V	
2119 ©	4822 126 13193	4,7nF	10%	63V	for 150W only
2119 ©	4822 126 14247	1,5nF	10%	50V	for 75W only
2120 ©	3198 017 41050	1µF	20%	10V	
2121 ©	3198 017 41050	1µF	20%	10V	
2122 ©	4822 126 13883	220pF	5%	50V	
2124	2022 031 00196	220µF	20%	50V	for 150W only
2125 ©	4822 126 13193	4,7nF	10%	63V	
2126 ©	2020 552 94427	100pF	5%	50V	
2128 ©	2222 580 15649	100nF	10%	50V	
2130 ©	4822 122 33496	100nF	10%	63V	
2132 ©	3198 017 41050	1µF	20%	10V	
2134	4822 121 42408	220nF	5%	63V	
2135 ©	3198 016 31020	1nF	5%	25V	for 75W only
2135 ©	4822 126 13881	470pF	5%	50V	for 150W only
2136 ©	2222 580 15649	100nF	10%	50V	
2137 ©	2222 867 15339	33pF	5%	50V	
2138	2020 012 93762	330µF	20%	50V	for 75W only
2139	2020 012 93762	330µF	20%	50V	for 75W only
2200 ©	4822 122 33496	100nF	10%	63V	
2201	2022 031 00196	220µF	20%	50V	for 150W only
2202 ©	2222 580 15649	100nF	10%	50V	
2203 ©	2222 580 15649	100nF	10%	50V	
2205	4822 124 80483	47µF	20%	6,3V	
2206 ©	5322 126 11578	1nF	10%	63V	
2208 ©	5322 126 11583	10nF	10%	63V	
2210 ©	3198 017 41050	1µF	20%	10V	
2211	4822 124 21913	1µF	20%	63V	
2212 ©	4822 126 13883	220pF	5%	50V	
2213 ©	4822 122 33496	100nF	10%	63V	
2214	4822 124 40248	10µF	20%	63V	
2215 ©	5322 126 11578	1nF	10%	63V	
2216	5322 121 42661	330nF	5%	63V	
2217 ©	4822 126 13883	220pF	5%	50V	
2218 ©	2222 580 15649	100nF	10%	50V	
2219 ©	5322 126 11578	1nF	10%	63V	

CAPACITORS

2220 ©	5322 126 11578	1nF	10%	63V	
2221 ©	4822 126 13193	4,7nF	10%	63V	for 150W only
2221 ©	4822 126 14247	1,5nF	10%	50V	for 75W only
2222 ©	3198 017 41050	1µF	20%	10V	
2225	2022 031 00196	220µF	20%	50V	for 150W only
2226 ©	4822 126 13193	4,7nF	10%	63V	
2227 ©	2020 552 94427	100pF	5%	50V	
2229 ©	2222 580 15649	100nF	10%	50V	
2234	4822 121 42408	220nF	5%	63V	
2236 ©	3198 017 41050	1µF	20%	10V	
2237 ©	3198 016 31020	1nF	5%	25V	for 75W only
2237 ©	4822 126 13881	470pF	5%	50V	for 150W only
2238 ©	3198 017 41050	1µF	20%	10V	
2239 ©	3198 017 41050	1µF	20%	10V	
2240 ©	2222 867 15339	33pF	5%	50V	
2241	2020 012 93762	330µF	20%	50V	for 75W only
2242	2020 012 93762	330µF	20%	50V	for 75W only
2300 ©	4822 126 13883	220pF	5%	50V	
2301 ©	4822 126 13883	220pF	5%	50V	
2303 ©	4822 126 13881	470pF	5%	50V	
2304	4822 124 80231	47µF	20%	16V	
2305 ©	3198 017 41050	1µF	20%	10V	
2306 ©	4822 126 14585	100nF	10%	50V	
2309	4822 124 21732	10µF	20%	25V	
2312 ©	2222 580 15649	100nF	10%	50V	
2313 ©	5322 126 11578	1nF	10%	63V	
2314 ©	4822 126 13883	220pF	5%	50V	
2316 ©	4822 126 14585	100nF	10%	50V	
2317	4822 124 21732	10µF	20%	25V	
2318 ©	4822 126 13881	470pF	5%	50V	
2319 ©	4822 126 14585	100nF	10%	50V	
2320 ©	4822 126 14585	100nF	10%	50V	
2321	4822 124 80231	47µF	20%	16V	
2322 ©	4822 126 14585	100nF	10%	50V	
2324	4822 124 40769	4,7µF	20%	100V	
2325 ©	4822 126 13881	470pF	5%	50V	
2326 ©	2020 552 94427	100pF	5%	50V	
2327 ©	2020 552 94427	100pF	5%	50V	
2328	4822 124 81151	22µF	20%	50V	
2329	4822 124 40769	4,7µF	20%	100V	
2330	4822 124 81151	22µF	20%	50V	
2331	4822 124 40769	4,7µF	20%	100V	
2332 ©	2020 552 94427	100pF	5%	50V	
2333 ©	2020 552 94427	100pF	5%	50V	
2334 ©	2222 867 15339	33pF	5%	50V	
2335 ©	2238 586 59812	100nF	10%	50V	
2336 ©	2238 586 59812	100nF	10%	50V	
2337	4822 124 21732	10µF	20%	25V	
2339 ©	3198 017 41050	1µF	20%	10V	
2340	4822 124 81151	22µF	20%	50V	
2341	4822 124 81151	22µF	20%	50V	
2400 ©	2020 552 94427	100pF	5%	50V	
2401 ©	4822 126 13881	470pF	5%	50V	
2402	4822 124 23052	100µF	20%	16V	
2403	4822 124 22651	1µF	20%	50V	
2404 ©	2020 552 94427	100pF	5%	50V	
2405	4822 124 40769	4,7µF	20%	100V	
2406	4822 124 80791	470µF	20%	16V	
2407 ©	2020 552 94427	100pF	5%	50V	
2408	4822 124 22651	1µF	20%	50V	
2409 ©	4822 126 13881	470pF	5%	50V	
2410	4822 124 23052	100µF	20%	16V	
2411 ©	2020 552 94427	100pF	5%	50V	
2415 ©	3198 017 41050	1µF	20%	10V	

ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

CAPACITORS

2416	4822 124 23052	100µF	20%	16V
2417©	3198 017 41050	1µF	20%	10V
2418©	2020 552 94427	100pF	5%	50V
2419©	2020 552 94427	100pF	5%	50V
2420©	3198 017 41050	1µF	20%	10V
2421©	2238 586 59812	100nF	10%	50V
2500	2022 020 00734	1µF	20%	50V
2519©	2238 586 59812	100nF	10%	50V
2520©	4822 126 13881	470pF	5%	50V
2528	2022 020 00734	1µF	20%	50V
2531©	4822 126 13881	470pF	5%	50V
2534	4822 124 40769	4,7µF	20%	100V
2535	4822 124 40769	4,7µF	20%	100V
2536©	2238 586 59812	100nF	10%	50V
2537	2022 020 00734	1µF	20%	50V
2540	2022 020 00734	1µF	20%	50V
2541	4822 124 81151	22µF	20%	50V
2542©	5322 126 11578	1nF	10%	63V
2543©	4822 126 14583	470nF	10%	16V
2546©	4822 126 14549	33nF	10%	16V
2547©	2222 780 15656	330nF	10%	16V
2550©	5322 126 11579	3,3nF	10%	63V
2551©	4822 126 13879	220nF	20%	16V
2552©	4822 126 13193	4,7nF	10%	63V
2553	4822 124 21913	1µF	20%	63V
2554©	4822 126 14583	470nF	10%	16V
2555	4822 124 80231	47µF	20%	16V
2556	4822 124 21913	1µF	20%	63V
2557	2022 020 00734	1µF	20%	50V
2558©	4822 126 14583	470nF	10%	16V
2559	2022 020 00734	1µF	20%	50V
2560©	4822 126 13881	470pF	5%	50V
2561©	4822 126 13881	470pF	5%	50V
2562©	4822 126 13881	470pF	5%	50V
2563©	4822 126 13881	470pF	5%	50V
2564©	4822 126 13881	470pF	5%	50V
2565©	4822 126 13881	470pF	5%	50V
2566©	4822 126 13881	470pF	5%	50V
2567©	4822 126 13881	470pF	5%	50V
2568	4822 124 80483	47µF	20%	6,3V
2569©	4822 126 14583	470nF	10%	16V
2570©	2020 552 94427	100pF	5%	50V
2571©	2020 552 94427	100pF	5%	50V
2572©	4822 126 13879	220nF	20%	16V
2574©	4822 126 13193	4,7nF	10%	63V
2576©	5322 126 11578	1nF	10%	63V
2577©	4822 126 14549	33nF	10%	16V
2578©	5322 126 11579	3,3nF	10%	63V
2579©	2020 552 96684	470nF	10%	25V
2581	4822 124 21913	1µF	20%	63V
2582©	2238 586 59812	100nF	10%	50V
2585©	2238 586 59812	100nF	10%	50V
2593©	2222 780 15656	330nF	10%	16V

RESISTORS

3100	4822 050 21003	10kΩ	2%	0,25W	
3101©	**2122 118 06085**	**0,033Ω**	**5%**	**1W**	**for 150W only**
3101©	**2122 118 06235**	**0,047Ω**	**5%**	**1W**	**for 75W only**
3102©	4822 051 30472	4,7kΩ	5%	0,06W	
3103©	4822 051 30102	1kΩ	5%	0,06W	
3106©	4822 051 30223	22kΩ	5%	0,06W	
3107©	4822 051 30152	1,5kΩ	5%	0,06W	
3108©	4822 051 30472	4,7kΩ	5%	0,06W	
3109©	4822 051 30101	100Ω	5%	0,06W	for 150W only

RESISTORS

3109©	4822 117 13608	4,7Ω	5%	0,06W	for 75W only
3110©	4822 117 13632	100kΩ	1%	0,06W	
3111©	4822 051 30109	10Ω	5%	0,06W	for 150W only
3111©	4822 117 12917	1Ω	5%	0,06W	for 75W only
3112©	4822 117 12925	47kΩ	1%	0,06W	
3113©	4822 051 30223	22kΩ	5%	0,06W	
3114©	4822 051 30472	4,7kΩ	5%	0,06W	
3115©	4822 051 30102	1kΩ	5%	0,06W	
3116©	4822 051 30474	470kΩ	5%	0,06W	
3117©	4822 117 12903	1,8kΩ	1%	0,06W	
3119©	4822 051 30103	10kΩ	5%	0,06W	for 150W only
3119©	4822 051 30153	15kΩ	5%	0,06W	for 75W only
3120©	4822 051 30472	4,7kΩ	5%	0,06W	
3121©	4822 051 30472	4,7kΩ	5%	0,06W	
3122©	4822 051 30153	15kΩ	5%	0,06W	
3125©	4822 051 30102	1kΩ	5%	0,06W	
3126©	4822 051 30103	10kΩ	5%	0,06W	
3127©	4822 051 30103	10kΩ	5%	0,06W	
3129©	4822 051 30102	1kΩ	5%	0,06W	
3130©	**2122 118 06085**	**0,033Ω**	**5%**	**1W**	**for 150W only**
3130©	**2122 118 06235**	**0,047Ω**	**5%**	**1W**	**for 75W only**
3133©	4822 051 30562	5,6kΩ	5%	0,06W	
3134©	4822 051 30331	330Ω	5%	0,06W	
3135©	4822 051 30101	100Ω	5%	0,06W	for 150W only
3135©	4822 117 13608	4,7Ω	5%	0,06W	for 75W only
3136©	4822 051 30472	4,7kΩ	5%	0,06W	
3137©	4822 051 30103	10kΩ	5%	0,06W	
3138©	4822 051 30103	10kΩ	5%	0,06W	
3139	4822 116 52226	560Ω	5%	0,5W	for 75W only
3139	4822 116 83883	470Ω	5%	0,16W	for 150W only
3140©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3140©	4822 117 11817	1,2kΩ	1%	0,06W	for 150W only
3142©	4822 117 11817	1,2kΩ	1%	0,06W	
3143©	4822 051 30102	1kΩ	5%	0,06W	
3144©	4822 051 30154	150kΩ	5%	0,06W	
3145©	4822 117 12139	22Ω	5%	0,06W	
3146©	4822 051 30152	1,5kΩ	5%	0,06W	
3147©	4822 051 30103	10kΩ	5%	0,06W	
3148©	4822 051 30183	18kΩ	5%	0,06W	
3149©	4822 051 30472	4,7kΩ	5%	0,06W	
3151©	4822 117 13632	100kΩ	1%	0,06W	
3152©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3152©	4822 117 12903	1,8kΩ	1%	0,06W	for 150W only
3153©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3153©	4822 117 12903	1,8kΩ	1%	0,06W	for 150W only
3154©	4822 051 30102	1kΩ	5%	0,06W	
3155©	4822 051 30472	4,7kΩ	5%	0,06W	
3156©	4822 051 30109	10Ω	5%	0,06W	for 150W only
3156©	4822 117 12917	1Ω	5%	0,06W	for 75W only
3201©	4822 117 12925	47kΩ	1%	0,06W	
3202©	4822 051 30109	10Ω	5%	0,06W	for 150W only
3202©	4822 117 12917	1Ω	5%	0,06W	for 75W only
3203©	4822 051 30223	22kΩ	5%	0,06W	
3205©	**2122 118 06085**	**0,033Ω**	**5%**	**1W**	**for 150W only**
3205©	**2122 118 06235**	**0,047Ω**	**5%**	**1W**	**for 75W only**
3207©	4822 051 30474	470kΩ	5%	0,06W	
3209©	4822 051 30102	1kΩ	5%	0,06W	
3210©	4822 051 30472	4,7kΩ	5%	0,06W	
3211©	4822 051 30102	1kΩ	5%	0,06W	
3212©	4822 051 30472	4,7kΩ	5%	0,06W	
3213©	4822 051 30102	1kΩ	5%	0,06W	
3215©	4822 051 30101	100Ω	5%	0,06W	for 150W only
3215©	4822 117 13608	4,7Ω	5%	0,06W	for 75W only
3216©	4822 051 30223	22kΩ	5%	0,06W	

ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

RESISTORS

3217©	4822 117 13632	100kΩ	1%	0,06W	
3218©	4822 051 30472	4,7kΩ	5%	0,06W	
3221©	4822 051 30103	10kΩ	5%	0,06W	
3225©	4822 117 12903	1,8kΩ	1%	0,06W	
3227©	4822 051 30103	10kΩ	5%	0,06W	
3228©	4822 051 30103	10kΩ	5%	0,06W	for 150W only
3228©	4822 051 30153	15kΩ	5%	0,06W	for 75W only
3229©	4822 051 30103	10kΩ	5%	0,06W	
3231©	4822 051 30472	4,7kΩ	5%	0,06W	
3232©	4822 051 30153	15kΩ	5%	0,06W	
3236©	4822 117 12139	22Ω	5%	0,06W	
3237©	4822 051 30103	10kΩ	5%	0,06W	
3240©	4822 051 30103	10kΩ	5%	0,06W	
3241©	4822 051 30102	1kΩ	5%	0,06W	
3243©	**2122 118 06085**	**0,033Ω**	**5%**	**1W**	**for 150W only**
3243©	**2122 118 06235**	**0,047Ω**	**5%**	**1W**	**for 75W only**
3245©	4822 051 30562	5,6kΩ	5%	0,06W	
3246©	4822 051 30331	330Ω	5%	0,06W	
3247©	4822 051 30101	100Ω	5%	0,06W	for 150W only
3247©	4822 117 13608	4,7Ω	5%	0,06W	for 75W only
3248©	4822 051 30472	4,7kΩ	5%	0,06W	
3251	4822 116 52226	560Ω	5%	0,5W	for 75W only
3251	4822 116 83883	470Ω	5%	0,16W	for 150W only
3252©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3252©	4822 117 11817	1,2kΩ	1%	0,06W	for 150W only
3253©	4822 117 11817	1,2kΩ	1%	0,06W	
3254©	4822 051 30154	150kΩ	5%	0,06W	
3255©	4822 051 30102	1kΩ	5%	0,06W	
3256©	4822 051 30152	1,5kΩ	5%	0,06W	
3258©	4822 051 30183	18kΩ	5%	0,06W	
3259©	4822 051 30472	4,7kΩ	5%	0,06W	
3261©	4822 051 30152	1,5kΩ	5%	0,06W	
3262©	4822 051 30101	100Ω	5%	0,06W	
3263©	4822 051 30103	10kΩ	5%	0,06W	
3264©	4822 117 13632	100kΩ	1%	0,06W	
3265©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3265©	4822 117 12903	1,8kΩ	1%	0,06W	for 150W only
3266©	4822 051 30152	1,5kΩ	5%	0,06W	for 75W only
3266©	4822 117 12903	1,8kΩ	1%	0,06W	for 150W only
3267©	4822 051 30102	1kΩ	5%	0,06W	
3268©	4822 051 30472	4,7kΩ	5%	0,06W	
3269©	4822 051 30109	10Ω	5%	0,06W	for 150W only
3269©	4822 117 12917	1Ω	5%	0,06W	for 75W only
3302©	4822 117 13632	100kΩ	1%	0,06W	
3303©	4822 051 30103	10kΩ	5%	0,06W	
3304	4822 116 52186	22Ω	5%	0,5W	
3305©	4822 051 30682	6,8kΩ	5%	0,06W	
3306	2120 368 90125	47kΩ	TRIMPOT.		
3307	2120 368 90125	47kΩ	TRIMPOT.		
3311©	4822 051 30103	10kΩ	5%	0,06W	
3312©	4822 117 13632	100kΩ	1%	0,06W	
3313©	4822 051 30221	220Ω	5%	0,06W	
3314©	4822 117 12925	47kΩ	1%	0,06W	
3315	4822 050 11002	1kΩ	5%	0,2W	
3316©	4822 051 30273	27kΩ	5%	0,06W	
3317©	4822 051 30333	33kΩ	5%	0,06W	
3318©	4822 117 13632	100kΩ	1%	0,06W	
3319©	4822 051 30222	2,2kΩ	5%	0,06W	
3320©	4822 051 30103	10kΩ	5%	0,06W	
3321©	4822 051 30102	1kΩ	5%	0,06W	
3322©	4822 051 30103	10kΩ	5%	0,06W	
3323©	4822 117 12968	820Ω	5%	0,06W	
3324©	4822 051 30105	1MΩ	5%	0,06W	
3325©	4822 051 30154	150kΩ	5%	0,06W	

RESISTORS

3326©	4822 051 30154	150kΩ	5%	0,06W	
3327 ▲	**4822 052 10339**	**33Ω**	**5%**	**0,33W**	**NFR**
3328©	5322 117 13056	8,2kΩ	1%	0,06W	
3329	4822 116 52256	2,2kΩ	5%	0,16W	
3330©	4822 051 30103	10kΩ	5%	0,06W	
3331©	4822 051 30103	10kΩ	5%	0,06W	
3332©	4822 051 30332	3,3kΩ	5%	0,06W	
3334©	4822 051 30102	1kΩ	5%	0,06W	
3336©	4822 051 30123	12kΩ	5%	0,06W	
3337©	4822 051 30331	330Ω	5%	0,06W	
3337©	4822 051 30471	470Ω	5%	0,06W	for 75W only
3338©	4822 051 30102	1kΩ	5%	0,06W	
3339©	4822 051 30222	2,2kΩ	5%	0,06W	
3340©	4822 051 30331	330Ω	5%	0,06W	
3340©	4822 051 30471	470Ω	5%	0,06W	for 75W only
3341©	4822 051 30682	6,8kΩ	5%	0,06W	
3342©	4822 051 30121	120Ω	5%	0,06W	
3343©	4822 051 30151	150Ω	5%	0,06W	
3344©	4822 051 30471	470Ω	5%	0,06W	
3345©	4822 051 30471	470Ω	5%	0,06W	
3346©	4822 051 30479	47Ω	5%	0,06W	
3350©	4822 051 30472	4,7kΩ	5%	0,06W	
3400©	4822 051 30273	27kΩ	5%	0,06W	
3401©	4822 051 30471	470Ω	5%	0,06W	
3403©	4822 051 30273	27kΩ	5%	0,06W	
3404©	4822 051 30682	6,8kΩ	5%	0,06W	
3405©	4822 051 30472	4,7kΩ	5%	0,06W	
3406 ▲	**4822 052 10109**	**10Ω**	**5%**	**0,33W**	**NFR**
3407©	4822 051 30472	4,7kΩ	5%	0,06W	
3408©	4822 051 30682	6,8kΩ	5%	0,06W	
3409©	4822 051 30273	27kΩ	5%	0,06W	
3411	4822 116 52283	4,7kΩ	5%	0,5W	
3412 ▲	**4822 052 10568**	**5,6Ω**	**5%**	**0,33W**	**NFR**
3413©	4822 051 30471	470Ω	5%	0,06W	
3415©	4822 051 30273	27kΩ	5%	0,06W	
3422©	4822 051 30472	4,7kΩ	5%	0,06W	
3423©	4822 051 30103	10kΩ	5%	0,06W	
3424©	4822 051 30103	10kΩ	5%	0,06W	
3425©	4822 051 30339	33Ω	5%	0,06W	
3426©	4822 051 30339	33Ω	5%	0,06W	
3427©	4822 051 30103	10kΩ	5%	0,06W	
3428©	4822 051 30103	10kΩ	5%	0,06W	
3429©	4822 051 30339	33Ω	5%	0,06W	
3430©	4822 051 30339	33Ω	5%	0,06W	
3431©	4822 051 30102	1kΩ	5%	0,06W	
3432©	4822 051 30102	1kΩ	5%	0,06W	
3433©	4822 051 30102	1kΩ	5%	0,06W	
3434©	4822 051 30222	2,2kΩ	5%	0,06W	
3435©	4822 051 30271	270Ω	5%	0,06W	
3436©	4822 051 30472	4,7kΩ	5%	0,06W	
3437©	4822 051 30562	5,6kΩ	5%	0,06W	
3438©	4822 051 30103	10kΩ	5%	0,06W	
3439©	4822 051 30103	10kΩ	5%	0,06W	
3440	4822 116 80176	1Ω	5%	0,5W	
3500©	4822 051 30152	1,5kΩ	5%	0,06W	
3501©	4822 051 30472	4,7kΩ	5%	0,06W	
3501©	4822 117 12917	1Ω	5%	0,06W	
3502©	4822 051 30472	4,7kΩ	5%	0,06W	
3502©	4822 117 12917	1Ω	5%	0,06W	
3504©	4822 051 30103	10kΩ	5%	0,06W	
3506©	4822 051 30471	470Ω	5%	0,06W	
3507©	4822 051 30562	5,6kΩ	5%	0,06W	for 75W only
3507©	5322 117 13056	8,2kΩ	1%	0,06W	
3508©	4822 051 30222	2,2kΩ	5%	0,06W	

ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

RESISTORS

3509©	4822 051 30222	2,2kΩ	5%	0,06W	
3510©	4822 051 30682	6,8kΩ	5%	0,06W	for 150W and 75W SA
3510©	4822 051 30223	22kΩ	5%	0,06W	for 75W TAPE only
3511©	4822 051 30682	6,8kΩ	5%	0,06W	for 150W and 75W SA
3511©	4822 051 30223	22kΩ	5%	0,06W	for 75W TAPE only
3514©	4822 051 30153	15kΩ	5%	0,06W	
3518©	4822 051 30152	1,5kΩ	5%	0,06W	
3519©	4822 051 30103	10kΩ	5%	0,06W	
3520©	4822 051 30153	15kΩ	5%	0,06W	
3522©	4822 051 30152	1,5kΩ	5%	0,06W	
3523©	4822 051 30152	1,5kΩ	5%	0,06W	
3524©	4822 117 11817	1,2kΩ	1%	0,06W	
3525©	4822 051 30102	1kΩ	5%	0,06W	
3525©	4822 051 30273	27kΩ	5%	0,06W	
3526©	4822 051 30334	330kΩ	5%	0,06W	
3527©	4822 051 30102	1kΩ	5%	0,06W	
3527©	4822 051 30273	27kΩ	5%	0,06W	
3529©	482 2 051 30154	150kΩ	5%	0,06W	
3531©	4822 051 30154	150kΩ	5%	0,06W	
3532©	4822 117 12864	82kΩ	5%	0,06W	
3533©	4822 051 30562	5,6kΩ	5%	0,06W	
3534▲	**4822 052 10109**	**10Ω**	**5%**	**0,33W**	**NFR**
3535©	4822 051 30562	5,6kΩ	5%	0,06W	
3536©	4822 051 30223	22kΩ	5%	0,06W	for 150W and 75W SA
3536©	4822 051 30102	1kΩ	5%	0,06W	for 75W TAPE only
3539©	4822 051 30153	15kΩ	5%	0,06W	
3542©	4822 051 30123	12kΩ	5%	0,06W	
3543©	5322 117 13056	8,2kΩ	1%	0,06W	
3544©	4822 051 30562	5,6kΩ	5%	0,06W	
3545©	4822 051 30393	39kΩ	5%	0,06W	
3549©	4822 051 30101	100Ω	5%	0,06W	
3550©	4822 051 30393	39kΩ	5%	0,06W	
3551©	4822 051 30101	100Ω	5%	0,06W	
3552©	4822 051 30101	100Ω	5%	0,06W	
3553©	4822 051 30101	100Ω	5%	0,06W	
3554©	4822 051 30101	100Ω	5%	0,06W	
3555©	4822 051 30562	5,6kΩ	5%	0,06W	
3556©	4822 051 30153	15kΩ	5%	0,06W	
3557©	4822 051 30101	100Ω	5%	0,06W	
3558©	4822 117 12903	1,8kΩ	1%	0,06W	
3559©	4822 117 12903	1,8kΩ	1%	0,06W	
3560©	4822 051 30101	100Ω	5%	0,06W	
3561©	4822 051 30102	1kΩ	5%	0,06W	
3562©	4822 051 30102	1kΩ	5%	0,06W	
3563©	4822 051 30101	100Ω	5%	0,06W	
3564©	4822 051 30101	100Ω	5%	0,06W	
3566©	4822 051 30101	100Ω	5%	0,06W	
3567©	4822 051 30101	100Ω	5%	0,06W	
3568©	4822 051 30101	100Ω	5%	0,06W	
3569©	4822 051 30102	1kΩ	5%	0,06W	
3570©	4822 117 13632	100kΩ	1%	0,06W	
3571©	4822 051 30223	22kΩ	5%	0,06W	for 150W and 75W SA
3571©	4822 051 30102	1kΩ	5%	0,06W	for 75W TAPE only
3572	4822 116 83883	470Ω	5%	0,16W	
3573	4822 116 83883	470Ω	5%	0,16W	
3574©	4822 051 30101	100Ω	5%	0,06W	
3575©	4822 051 30562	5,6kΩ	5%	0,06W	
3576©	4822 051 30123	12kΩ	5%	0,06W	
3577©	4822 051 30153	15kΩ	5%	0,06W	
3578©	5322 117 13056	8,2kΩ	1%	0,06W	
3579©	4822 051 30562	5,6kΩ	5%	0,06W	
3580©	4822 051 30101	100Ω	5%	0,06W	
3581©	4822 051 30101	100Ω	5%	0,06W	

RESISTORS

3591©	4822 051 30102	1kΩ	5%	0,06W	for 75W only
3591©	4822 051 30332	3,3kΩ	5%	0,06W	for 150W only
4211©	4822 051 20008	CHIP JUMPER 0805			
4212©	4822 051 20008	CHIP JUMPER 0805			
4213©	4822 051 30008	CHIP JUMPER 0603			
4214©	4822 051 20008	CHIP JUMPER 0805			
4216©	4822 051 30008	CHIP JUMPER 0603			
4217©	4822 051 30008	CHIP JUMPER 0603			
4223©	4822 051 30008	CHIP JUMPER 0603			
4226©	4822 051 30008	CHIP JUMPER 0603			
4230©	4822 051 30008	CHIP JUMPER 0603			
4232©	4822 051 20008	CHIP JUMPER 0805			
4233©	4822 051 30008	CHIP JUMPER 0603			
4235©	4822 051 30008	CHIP JUMPER 0603			
4240©	4822 051 20008	CHIP JUMPER 0805			
4241©	4822 051 20008	CHIP JUMPER 0805			
4245©	4822 051 30008	CHIP JUMPER 0603			
4253©	4822 051 30008	CHIP JUMPER 0603			
4260©	4822 051 20008	CHIP JUMPER 0805			
4265©	4822 051 30008	CHIP JUMPER 0603			
4272©	4822 051 30008	CHIP JUMPER 0603			
4273©	4822 051 30008	CHIP JUMPER 0603			
4274©	4822 051 30008	CHIP JUMPER 0603			
4276©	4822 051 30008	CHIP JUMPER 0603			
4277©	4822 051 30008	CHIP JUMPER 0603			
4279©	4822 051 30008	CHIP JUMPER 0603			
4280©	4822 051 20008	CHIP JUMPER 0805			
4281©	4822 051 30008	CHIP JUMPER 0603			
4282©	4822 051 20008	CHIP JUMPER 0805			
4283©	4822 051 30008	CHIP JUMPER 0603			
4286©	4822 051 30008	CHIP JUMPER 0603			
4287©	4822 051 30008	CHIP JUMPER 0603			
4289©	4822 051 30008	CHIP JUMPER 0603			
4290©	4822 051 30008	CHIP JUMPER 0603			
4301©	4822 051 30008	CHIP JUMPER 0603			

COILS

5100	4822 157 11411	FERRITE BEAD	
5101	**2422 536 00612**	**30µH**	**for 75W only**
5102	**2422 549 44944**	**Mains Filter 330µH 3A**	
5103	4822 157 11411	FERRITE BEAD	
5105	**2422 536 00686**	**20µH**	**for 150W only**
5200	4822 157 11411	FERRITE BEAD	
5201	**2422 536 00612**	**30µH**	**for 75W only**
5202	**2422 549 44944**	**Mains Filter 330µH 3A**	
5203	4822 157 11411	FERRITE BEAD	
5204	**2422 536 00686**	**20µH**	**for 150W only**
5300	**2422 540 98542**	**Resonator 500kHz**	
5302	**2422 540 98561**	**Resonator 425kHz**	
5303	4822 157 11411	FERRITE BEAD	

DIODES

6104©	4822 130 11397	BAS316
6106©	4822 130 11416	PDZ6.8B
6108©	4822 130 11416	PDZ6.8B
6109©	4822 130 11397	BAS316
6110©	4822 130 10328	BAV99W
6111©	4822 130 11397	BAS316
6113©	4822 130 10328	BAV99W
6114©	4822 130 10328	BAV99W
6202©	4822 130 11397	BAS316
6205©	4822 130 10328	BAV99W
6206©	4822 130 10328	BAV99W
6208©	4822 130 10328	BAV99W

ELECTRICAL PARTSLIST *POWER 2003 75&150W Class-D* ***COMBI BOARD***

DIODES

6210©	4822 130 10328	BAV99W
6211©	4822 130 10328	BAV99W
6212©	4822 130 11416	PDZ6.8B
6213©	4822 130 11416	PDZ6.8B
6214©	4822 130 11397	BAS316
6216	4822 130 30621	1N4148
6217©	4822 130 11397	BAS316
6300©	4822 130 10838	UDZ3.3B
6401	4822 130 30621	1N4148
6403©	4822 130 10838	UDZ3.3B
6404©	4822 130 11397	BAS316
6500	4822 130 61219	BZX79-C10
6501©	9322 102 64685	UDZ-2,7B
6502©	4822 130 11397	BAS316
6503©	4822 130 11397	BAS316
6504©	4822 130 11397	BAS316
6505©	4822 130 11397	BAS316
6506©	9322 150 18685	BZX384-C47
6507©	9322 150 18685	BZX384-C47
6508©	3198 020 55680	BZX384-C5V6

TRANSISTORS

7104©	4822 130 60373	BC856B	
7109▲	9322 173 29687	STP14NF12FP, FET POWER	for 75W only
7109▲	9340 578 15127	PHX18NQ11T, FET POWER	for 150W only
7110©	3198 010 42310	BC847BW	
7111©	3198 010 44350	BC807-25W	
7112©	3198 010 42320	BC857BW	
7113©	3198 010 44350	BC807-25W	
7114©	9340 219 30115	BC817-25W	
7115©	9340 219 30115	BC817-25W	
7117©▲	9337 760 90215	PMBTA42	
7119©▲	9337 760 90215	PMBTA42	
7121▲	9322 173 29687	STP14NF12FP, FET POWER	for 75W only
7121▲	9340 578 15127	PHX18NQ11T, FET POWER	for 150W only
7128©	4822 130 60373	BC856B	
7129©	4822 130 60373	BC856B	
7130©	3198 010 42310	BC847BW	
7131©	5322 130 60159	BC846B	
7132©	9340 219 30115	BC817-25W	for 150W only
7133©	9340 219 30115	BC817-25W	for 150W only
7203©	3198 010 42310	BC847BW	
7208©	4822 130 60373	BC856B	
7210©	3198 010 44350	BC807-25W	
7211©	3198 010 42320	BC857BW	
7218▲	9322 173 29687	STP14NF12FP, FET POWER	for 75W only
7218▲	9340 578 15127	PHX18NQ11T, FET POWER	for 150W only
7221©	3198 010 44350	BC807-25W	
7222©	9340 219 30115	BC817-25W	
7223©	9340 219 30115	BC817-25W	
7227©▲	9337 760 90215	PMBTA42	
7228©▲	9337 760 90215	PMBTA42	
7231▲	9322 173 29687	STP14NF12FP, FET POWER	for 75W only
7231▲	9340 578 15127	PHX18NQ11T, FET POWER	for 150W only
7238©	5322 130 60159	BC846B	
7239©	4822 130 60373	BC856B	
7240©	4822 130 60373	BC856B	
7243©	9340 219 30115	BC817-25W	
7244©	9340 219 30115	BC817-25W	for 150W only
7245©	9340 219 30115	BC817-25W	for 150W only
7309©	3198 010 42310	BC847BW	
7316©	3198 010 42320	BC857BW	
7317©	3198 010 42310	BC847BW	
7319©	3198 010 42310	BC847BW	

TRANSISTORS

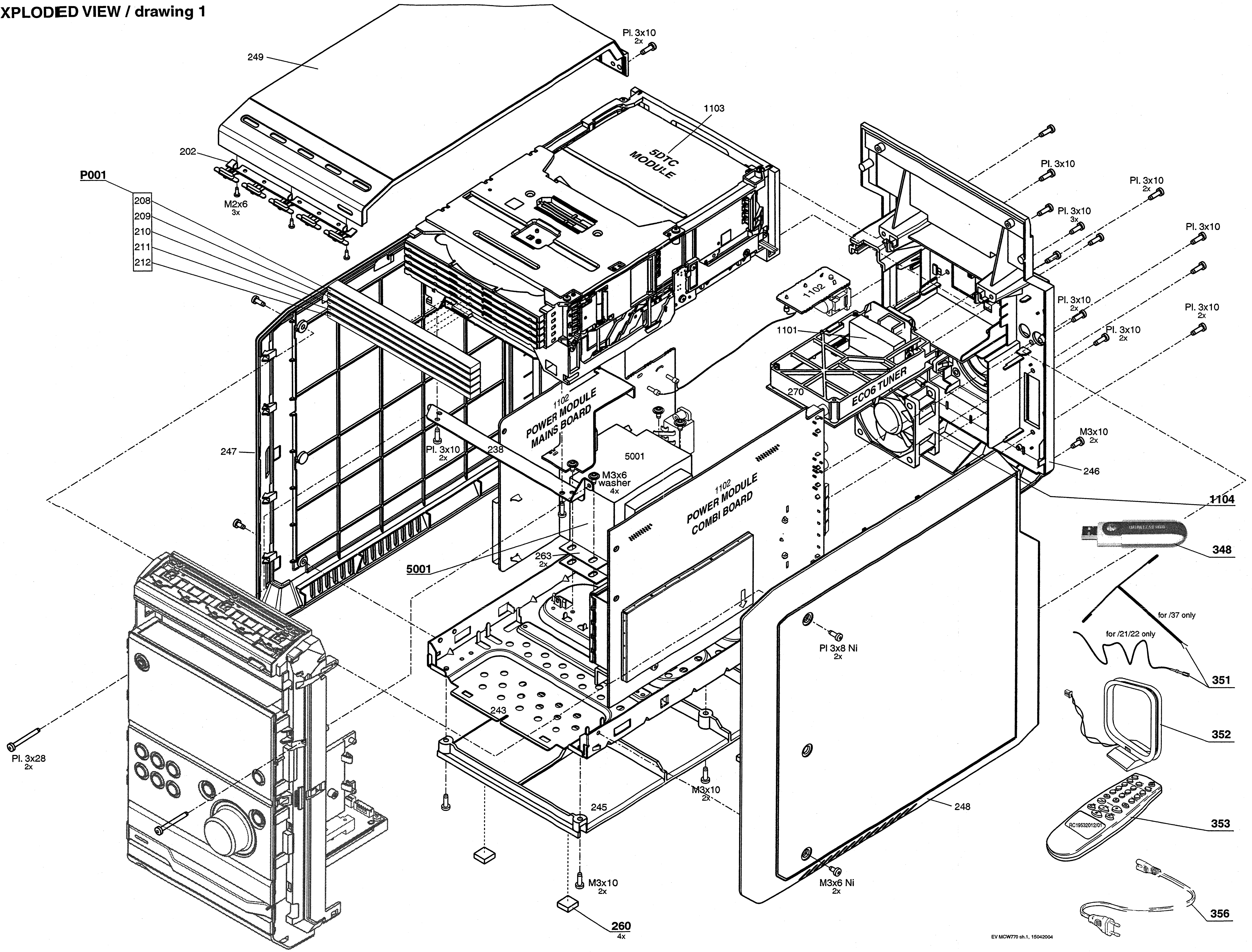
7323©	9340 219 30115	BC817-25W
7324©	9340 219 30115	BC817-25W
7402	4822 130 40855	BC337-40
7405©	3198 010 42320	BC857BW
7407©	9340 219 30115	BC817-25W
7408©	9340 219 30115	BC817-25W
7409©	9340 219 30115	BC817-25W
7410©	3198 010 42320	BC857BW
7411©	3198 010 44350	BC807-25W
7505©	3198 010 42310	BC847BW
7506©	3198 010 42320	BC857BW
7509©	3198 010 42310	BC847BW

INTEGRATED CIRCUITS

7105©	9350 694 90118	74LV14D
7118©	9350 694 90118	74LV14D
7122©	5322 209 11517	PC74HCU04T, HEX INVERTER IC
7209©	9350 694 90118	74LV14D
7232©	5322 209 11517	PC74HCU04T, HEX INVERTER IC
7235©	9350 694 90118	74LV14D
7311	4822 209 14933	TL431IZ, PROGRAMMABLE VOLT.REF
7312©	5322 209 11517	PC74HCU04T, HEX INVERTER IC
7315	4822 209 81351	LM317MPTB
7320©	4822 209 83357	NJM4560M
7321	4822 209 81351	LM317MPTB
7400©	4822 209 31378	NJM4556M, 2-FOLD OP-AMP.
7406©	4822 209 17345	M62320FP, I2C SHIFT REGISTER
7508©	9322 150 74668	TDA7468D, SOURCE SEL. & SOUND

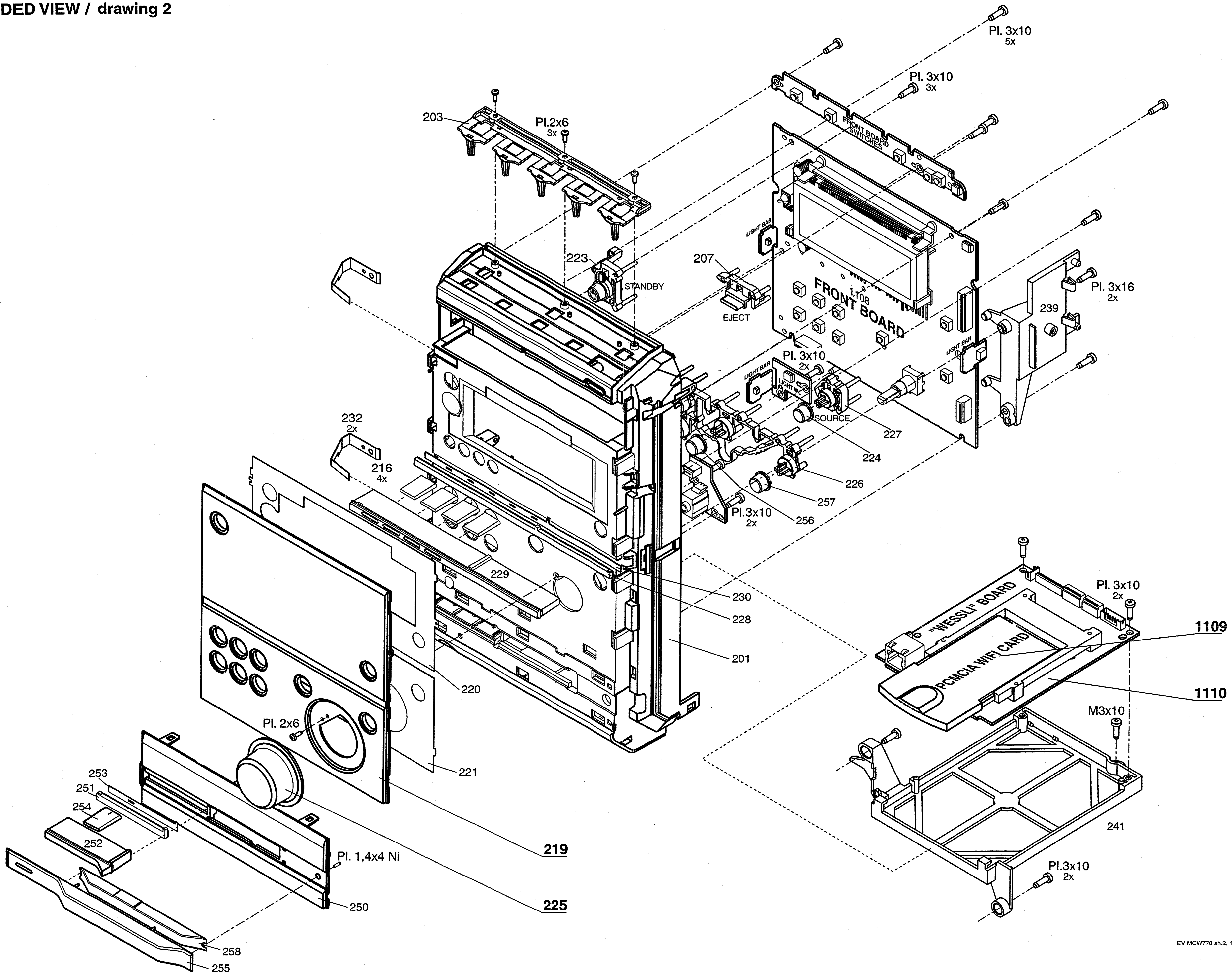
Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.

EXPLODED VIEW / drawing 1

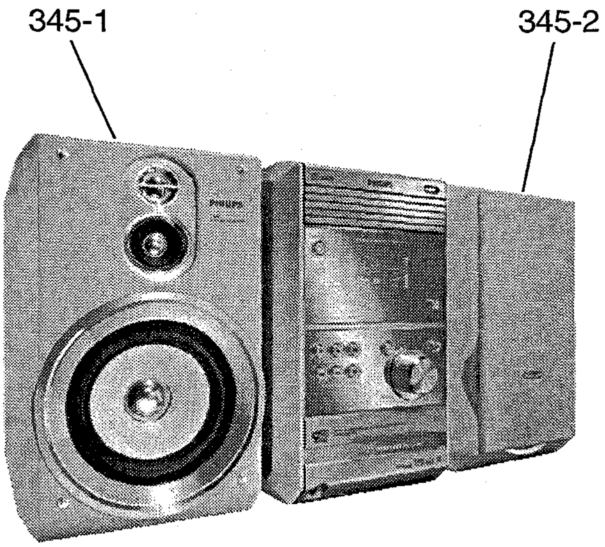

Pl. 3x10
2x
249
1103
5DTC MODULE
202
P001
208
209
210
211
212
M2x6
3x
Pl. 3x10
Pl. 3x10
2x
Pl. 3x10
3x
Pl. 3x10
1102
Pl. 3x10
2x
Pl. 3x10
2x
1101
Pl. 3x10
2x
270
ECO6 TUNER
1102
POWER MODULE
MAINS BOARD
247
Pl. 3x10
2x
238
5001
M3x6
washer
4x
1102
POWER MODULE
COMBI BOARD
M3x10
2x
246
1104
348
5001
263
2x
for /37 only
for /21/22 only
351
Pl 3x8 Ni
2x
243
352
Pl. 3x28
2x
M3x10
2x
245
248
353
RC19532012/01
M3x10
2x
M3x6 Ni
2x
356
260
4x

EV MCW770 sh.1, 15042004

EXPLODED VIEW / drawing 2


Pl. 3x10
5x
Pl. 3x10
3x
203
Pl.2x6
3x
FRONT BOARD SWITCHES
LIGHT BAR
223
STANDBY
207
EJECT
1108
FRONT BOARD
Pl. 3x16
2x
239
LIGHT BAR
Pl. 3x10
2x
LIGHT BAR
LIGHT WC
SOURCE
227
224
226
257
256
Pl.3x10
2x
232
2x
216
4x
229
230
228
201
220
221
Pl. 2x6
219
225
253
251
254
252
Pl. 1,4x4 Ni
250
258
255
Pl. 3x10
2x
"WESSLI" BOARD
PCMCIA WIFI CARD
1109
1110
M3x10
241
Pl.3x10
2x

MECHANICAL PARTSLIST & ACCESSORIES



MECHANICAL PARTS

219	3103 308 15151	DISPLAY WINDOW
225	3103 308 15322	KNOB, VOLUME
260	3139 113 27140	FOOT RUBBER 4MM
P001	3141 079 00781	ORNAMENT. COVERS, TRAY MCW770

MISCELLANEOUS

345-1	9965 000 25100	SPEAKER BOX (L)	
345-2	9965 000 25146	SPEAKER BOX (R)	
348	2822 062 41032	WL USB STICK, B-220 US	for /37 only
348	2822 062 41034	WL USB STICK, B-220 EU	for /21/22 only
351	2422 076 00546	FM ANTENNA WIRE	for /21/22 only
351	4822 320 11094	FM DIPOLE ANTENNA	for /37 only
352	2422 549 45067	AM Loop Antenna	
353	3139 238 08491	RC19532014/01, REMOTE CONTROL	
356	2422 070 98151	MAINS CORD, EUROPE	for /21/22 only
356	2422 070 98246	MAINS CORD, UL	for /37 only
1101	3103 308 64260	TUNER BOARD ECO6 AS /01	for /21/22 only
1101	3103 308 64281	TUNER BOARD EC06 AS /17	for /37 only
1104	2822 031 01494	FAN 12VDC 0.8W 3100RPM B	
1109	2822 062 41028	PCMCIA WIFI CARD, US	for /37 only
1109	2822 062 41031	PCMCIA WIFI CARD, EURO	for /21/22 only
1110	3103 308 67861	„WESSLI“ BOARD ASSY	
5001	3103 308 30870	Mains Transformer /37	
5001	3103 308 30880	Mains Transformer /22	
5001	3103 308 30890	Mains Transformer /21	
8001	4822 320 12752	FLEXFOIL CABLE, 7P, 180mm AD	
8003	3139 111 02551	FLEXFOIL CABLE, 15P,480mm BD	
8004	3139 111 02541	FLEXFOIL CABLE, 8P, 280mm AD	
8005	4822 320 12654	FLEXFOIL CABLE, 7P, 220mm AD	
8006	3139 110 35050	FLEXFOIL CABLE, 8P, 220mm AD	
8007	3139 110 34780	FLEXFOIL CABLE, 4P, 280mm BD	
8008	3139 111 02371	FLEXFOIL CABLE, 19P, 180mm AD	
8009	4822 320 12604	FLEXFOIL CABLE, 9P, 220mm AD	
8011	3103 308 94061	FLATFOIL CABLE, 4P, 128mm BD	
8015	3103 308 94071	FLATFOIL CABLE, 4P, 88mm AD	
8016	3103 308 94071	FLATFOIL CABLE, 4P, 88mm AD	
8017	3103 308 94081	FLATFOIL CABLE, 4P, 75mm AD	
8018	3103 308 94081	FLATFOIL CABLE, 4P, 75mm AD	

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.

ELECTRICAL PARTSLIST *FRONT BOARD (inclusive Headphone Board, CD Key Board and Lightbar Boards)*

> **Note:**
> Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
> Code numbers are published for orientation only.

MISCELLANEOUS

1400	2422 025 14518	FFC-CONNECTOR, 9P, TOP ENTRY
1403	4822 265 11553	FFC-CONNECTOR, 19P, TOP ENTRY
1404	2422 025 16979	FFC-CONNECTOR 4P, SIDE ENTRY
1405	4822 265 11515	FFC-CONNECTOR, 8P, TOP ENTRY
1415	2422 025 16727	FFC-CONNECTOR, 4P, TOP ENTRY
1417	4822 276 13114	TACT SWITCH
1418	2422 025 16727	FFC-CONNECTOR, 4P, TOP ENTRY
1419	4822 276 13114	TACT SWITCH
1423	4822 276 13114	TACT SWITCH
1425	2422 129 16708	ROTARY ENCODER
1429	4822 276 13114	TACT SWITCH
1431	4822 276 13114	TACT SWITCH
1432	4822 276 13114	TACT SWITCH
1433	4822 276 13114	TACT SWITCH
1434	4822 276 13114	TACT SWITCH
1435	4822 276 13114	TACT SWITCH
1437	4822 276 13114	TACT SWITCH
1445	2422 025 16979	FFC-CONNECTOR 4P, SIDE ENTRY
1448	2422 026 05059	HEADPHONE SOCKET, 3,5mm, JACK
1449	4822 267 10733	FFC CONNECTOR, 4P, TOP ENTRY
1450	2422 025 16979	FFC-CONNECTOR 4P, SIDE ENTRY
1451	4822 276 13114	TACT SWITCH
1452	4822 276 13114	TACT SWITCH
1454	4822 276 13114	TACT SWITCH
1456	4822 276 13114	TACT SWITCH
1458	4822 276 13114	TACT SWITCH
1460	4822 276 13114	TACT SWITCH
1461	2422 025 16979	FFC-CONNECTOR 4P, SIDE ENTRY
1462	2422 025 16979	FFC-CONNECTOR 4P, SIDE ENTRY
1463	2422 025 16979	FFC-CONNECTOR 4P, SIDE ENTRY
7402	3103 308 55521	DISPLAY MCW770
7405	9322 185 97667	TSOP4836ZC1, IR EYE

CAPACITORS

2402	3198 029 51090	10µF	20%	50V	
2403	3198 029 51090	10µF	20%	50V	
2406©	3198 016 34790	47pF	5%	50V	
2407©	3198 016 34790	47pF	5%	50V	
2408©	3198 016 34790	47pF	5%	50V	
2409©	3198 016 34790	47pF	5%	50V	
2415©	3198 017 31040	100nF	10%	16V	
2417	3198 028 54770	0,47µF	20%	50V	
2420©	3198 016 31590	15pF	5%	50V	
2421©	3198 017 31030	10nF	10%	50V	
2423©	3198 016 31590	15pF	5%	50V	
2425	3198 028 12210	220µF	20%	10V	
2426	3198 028 24790	47µ	20%	16V	
2427©	3198 017 31040	100nF	10%	16V	
2428	3198 028 12210	220µF	20%	10V	
2429©	3198 017 32220	2,2nF	10%	50V	
2430©	3198 016 31020	1nF	5%	25V	
2431©	3198 017 31040	100nF	10%	16V	for /22 only
2432©	3198 017 31040	100nF	10%	16V	
2433©	3198 016 34790	47pF	5%	50V	
2434©	3198 016 34790	47pF	5%	50V	for /22 only
2435©	3198 016 35610	47pF	5%	50V	for /22 only
2436©	3198 016 34790	47pF	5%	50V	
2437	3198 025 52280	2,2µF	20%	50V	for /22 only
2438©	3198 016 34790	47pF		50V	
2439©	3198 016 34790	47pF	5%	50V	
2440©	3198 016 34790	47pF	5%	50V	
2441©	3198 016 35610	47pF	5%	50V	for /22 only
2442©	3198 016 34790	47pF	5%	50V	for /22 only
2443©	3198 016 34790	47pF	5%	50V	for /22 only
2444©	3198 016 34790	47pF	5%	50V	for /22 only
2445©	3198 016 34790	47pF	5%	50V	for /22 only
2446©	2020 552 96664	33pF	2%	50V	
2447©	3198 016 32290	22pF	5%	50V	
2448©	3198 016 32290	22pF	5%	50V	
2449©	3198 016 32280	2,2pF	10%	50V	
2450©	3198 016 34710	470pF	5%	50V	
2451	3198 028 21090	10µF	20%	16V	for /22 only
2470	3198 028 24790	47µ	20%	16V	
2471©	3198 017 31040	100nF	10%	16V	
2472	3198 029 51080	1µF	20%	50V	
2473	3198 028 21010	100µF	20%	16V	
2474©	3198 017 42240	220nF	20%	16V	
2475©	3198 016 31010	100pF	5%	50V	
2476©	3198 016 31010	100pF	5%	50V	
2477©	3198 016 31010	100pF	5%	50V	
2478©	3198 016 31010	100pF	5%	50V	
2479	3198 028 21010	100µF	20%	16V	
2481©	3198 017 31030	10nF	5%	50V	
2482©	3198 017 31030	10nF	5%	50V	
2497©	3198 017 32230	22nF	10%	25V	
2498©	3198 023 41040	100nF	10%	25V	
2499©	3198 017 32230	22nF	10%	25V	

RESISTORS

3400 ▲©	**4822 051 30479**	**47Ω**	**5%**	**0,06W**
3401©	3198 021 32230	22kΩ	5%	0,06W
3402 ▲©	**4822 051 30479**	**47Ω**	**5%**	**0,06W**
3403©	3198 021 38230	82kΩ	5%	0,06W
3404©	3198 021 34710	470Ω	5%	0,06W
3405©	3198 021 38230	82kΩ	5%	0,06W
3406©	3198 021 34710	470Ω	5%	0,06W
3407©	3198 021 38210	820Ω	5%	0,06W
3408©	3198 021 31030	10kΩ	5%	0,06W
3409©	3198 021 31030	10kΩ	5%	0,06W
3410©	3198 021 31030	10kΩ	5%	0,06W
3411©	3198 021 31030	10kΩ	5%	0,06W
3412©	3198 021 32210	220Ω	5%	0,06W
3413©	3198 021 32210	220Ω	5%	0,06W
3414©	3198 021 32210	220Ω	5%	0,06W
3415©	3198 021 32210	220Ω	5%	0,06W
3416©	3198 021 32210	220Ω	5%	0,06W
3417©	3198 021 32210	220Ω	5%	0,06W
3418©	3198 021 32210	220Ω	5%	0,06W
3419©	3198 021 32210	220Ω	5%	0,06W
3420©	3198 021 32210	220Ω	5%	0,06W
3421©	3198 021 32210	220Ω	5%	0,06W
3422©	3198 021 32210	220Ω	5%	0,06W
3423©	3198 021 32210	220Ω	5%	0,06W
3424©	3198 021 32210	220Ω	5%	0,06W
3425©	3198 021 31020	1kΩ	5%	0,06W
3426©	3198 021 31030	10kΩ	5%	0,06W

RESISTORS

3427©	3198 021 31020	1kΩ	5%	0,06W	
3428©	3198 021 34710	470Ω	5%	0,06W	
3429©	3198 021 32210	220Ω	5%	0,06W	
3430©	3198 021 32210	220Ω	5%	0,06W	
3431©	3198 021 32210	220Ω	5%	0,06W	
3432©	3198 021 32210	220Ω	5%	0,06W	
3433©	3198 021 32210	220Ω	5%	0,06W	
3434©	3198 021 32210	220Ω	5%	0,06W	
3435©	3198 021 32210	220Ω	5%	0,06W	
3436©	3198 021 32210	220Ω	5%	0,06W	
3437©	3198 021 32210	220Ω	5%	0,06W	
3438©	3198 021 32210	220Ω	5%	0,06W	
3439©	3198 021 32210	220Ω	5%	0,06W	
3440©	3198 021 32210	220Ω	5%	0,06W	
3441©	3198 021 32210	220Ω	5%	0,06W	
3442	3198 011 04790	47Ω	5%	0,16W	for /22 only
3443©	3198 021 31020	1kΩ	5%	0,06W	
3444©	3198 021 31020	1kΩ	5%	0,06W	
3445©	3198 021 31020	1kΩ	5%	0,06W	
3446©	3198 021 31030	10kΩ	5%	0,06W	
3447©	3198 021 34710	470Ω	5%	0,06W	
3448©	3198 021 32210	220Ω	5%	0,06W	
3449©	3198 021 31520	1,5kΩ	5%	0,06W	
3450©	3198 021 32210	220Ω	5%	0,06W	
3451©	3198 021 31520	1,5kΩ	5%	0,06W	
3452©	3198 021 32210	220Ω	5%	0,06W	
3453©	3198 021 31520	1,5kΩ	5%	0,06W	
3454©	3198 021 32210	220Ω	5%	0,06W	
3455©	3198 021 31520	1,5kΩ	5%	0,06W	
3456©	3198 021 32210	220Ω	5%	0,06W	
3457©	3198 021 31020	1kΩ	5%	0,06W	
3458©	3198 021 32210	220Ω	5%	0,06W	
3459©	3198 021 32210	220Ω	5%	0,06W	
3460©	3198 021 32210	220Ω	5%	0,06W	
3461©	3198 021 31020	1kΩ	5%	0,06W	
3462©	3198 021 32210	220Ω	5%	0,06W	
3463©	3198 021 32210	220Ω	5%	0,06W	
3464©	3198 021 32210	220Ω	5%	0,06W	
3465©	3198 021 32240	220kΩ	5%	0,06W	
3466©	3198 021 32210	220Ω	5%	0,06W	
3467©	3198 021 32240	220kΩ	5%	0,06W	
3468©	3198 021 32210	220Ω	5%	0,06W	
3469©	3198 021 32210	220Ω	5%	0,06W	
3470©	3198 021 32210	220Ω	5%	0,06W	
3471©	3198 021 34710	470Ω	5%	0,06W	
3472©	3198 021 32210	220Ω	5%	0,06W	
3473©	3198 021 31020	1kΩ	5%	0,06W	
3474©	3198 021 31010	100Ω	5%	0,06W	
3475©	3198 021 31020	1kΩ	5%	0,06W	
3476 ▲©	**4822 117 13613**	**2,2Ω**	**5%**	**0,06W**	
3477©	3198 021 31010	100Ω	5%	0,06W	
3478©	3198 021 31020	1kΩ	5%	0,06W	
3479©	3198 021 31010	100Ω	5%	0,06W	
3480©	3198 021 31010	100Ω	5%	0,06W	
3481©	3198 021 31010	100Ω	5%	0,06W	
3482©	3198 021 34710	470Ω	5%	0,06W	
3483©	3198 021 31030	10kΩ	5%	0,06W	
3484©	3198 021 31020	1kΩ	5%	0,06W	
3485©	3198 021 31020	1kΩ	5%	0,06W	
3486©	3198 021 31010	100Ω	5%	0,06W	
3487©	3198 021 31010	100Ω	5%	0,06W	
3488©	3198 021 31010	100Ω	5%	0,06W	
3489©	3198 021 31020	1kΩ	5%	0,06W	

RESISTORS

3491©	3198 021 31010	100Ω	5%	0,06W	
3490©	3198 021 31020	1kΩ	5%	0,06W	
3492©	3198 021 31020	1kΩ	5%	0,06W	
3493©	3198 021 31020	1kΩ	5%	0,06W	
3494©	3198 021 31020	1kΩ	5%	0,06W	
3495©	3198 021 31020	1kΩ	5%	0,06W	
3496©	3198 021 31020	1kΩ	5%	0,06W	
3497©	3198 021 31010	100Ω	5%	0,06W	
3499©	3198 021 34710	470Ω	5%	0,06W	
3500©	3198 021 31020	1kΩ	5%	0,06W	
3501©	3198 021 31020	1kΩ	5%	0,06W	
3502©	3198 021 31020	1kΩ	5%	0,06W	
3503©	3198 021 31010	100Ω	5%	0,06W	
3504©	3198 021 31010	100Ω	5%	0,06W	
3505©	3198 021 31010	100Ω	5%	0,06W	
3506©	3198 021 31020	1kΩ	5%	0,06W	
3507©	3198 021 31020	1kΩ	5%	0,06W	
3508©	3198 021 31020	1kΩ	5%	0,06W	
3509©	3198 021 31020	1kΩ	5%	0,06W	
3510©	3198 021 31020	1kΩ	5%	0,06W	
3511©	3198 021 34710	470Ω	5%	0,06W	
3512©	3198 021 31020	1kΩ	5%	0,06W	
3513©	3198 021 31020	1kΩ	5%	0,06W	
3514©	3198 021 31010	100Ω	5%	0,06W	
3515©	3198 021 34710	470Ω	5%	0,06W	
3516©	3198 021 34710	470Ω	5%	0,06W	
3517©	3198 021 31030	10kΩ	5%	0,06W	
3518©	3198 021 34710	470Ω	5%	0,06W	
3519©	3198 021 31030	10kΩ	5%	0,06W	
3520©	3198 021 34710	470Ω	5%	0,06W	
3521©	3198 021 34710	470Ω	5%	0,06W	
3522©	3198 021 31010	100Ω	5%	0,06W	
3523©	3198 021 31020	1kΩ	5%	0,06W	
3524©	3198 021 34720	4,7kΩ	5%	0,06W	
3525©	3198 021 31020	1kΩ	5%	0,06W	
3526©	3198 021 34720	4,7kΩ	5%	0,06W	
3527©	3198 021 31030	10kΩ	5%	0,06W	for /22 only
3528©	3198 021 31030	10kΩ	5%	0,06W	for /22 only
3529©	3198 021 31020	1kΩ	5%	0,06W	for /22 only
3530©	3198 021 31020	1kΩ	5%	0,06W	for /22 only
3533©	3198 021 32240	220kΩ	5%	0,06W	for /22 only
3534©	3198 021 32220	2,2kΩ	5%	0,06W	for /22 only
3537©	3198 021 31030	10kΩ	5%	0,06W	
3538©	3198 021 31030	10kΩ	5%	0,06W	
3540©	3198 021 31030	10kΩ	5%	0,06W	
3541©	3198 021 31030	10kΩ	5%	0,06W	
3542©	3198 021 31030	10kΩ	5%	0,06W	
3543©	3198 021 31030	10kΩ	5%	0,06W	
3544©	3198 021 31030	10kΩ	5%	0,06W	
3545©	3198 021 31030	10kΩ	5%	0,06W	
3547©	3198 021 34720	4,7kΩ	5%	0,06W	
3549 ▲	**4822 052 10338**	**3,3Ω**	**5%**	**0,33W**	**NFR**
3550 ▲	**4822 052 10338**	**3,3Ω**	**5%**	**0,33W**	**NFR**
3560 ▲	**4822 052 10478**	**4,7Ω**	**5%**	**0,33W**	**NFR**
3561©	3198 021 34710	470Ω	5%	0,06W	
3562©	3198 021 32720	2,7kΩ	5%	0,06W	
3563©	3198 021 32720	2,7kΩ	5%	0,06W	
3564©	3198 021 34710	470Ω	5%	0,06W	
3565©	3198 021 34710	470Ω	5%	0,06W	
3566	3198 011 06840	680kΩ	5%	0,16W	
3567	3198 011 01030	10kΩ	5%	0,16W	
3568	3198 011 02210	220Ω	5%	0,16W	
3569©	3198 021 32210	220Ω	5%	0,06W	
3570©	3198 021 34710	470Ω	5%	0,06W	

ELECTRICAL PARTSLIST ***FRONT BOARD*** *(inclusive Headphone Board, CD Key Board and Lightbar Boards)*

RESISTORS

3571 ©	3198 021 34720	4,7kΩ	5%	0,06W
3572 ©	3198 021 34740	470kΩ	5%	0,06W
3573 ©	3198 021 33330	33kΩ	5%	0,06W
3574 ©	3198 021 31510	150Ω	5%	0,06W
3575 ©	3198 021 31510	150Ω	5%	0,06W
3577 ©	3198 021 90030	CHIP JUMPER 0603		
3578	3198 011 02710	270Ω	5%	0,16W
3579 ©	3198 021 32710	270Ω	5%	0,06W
3580 ©	3198 021 31210	120Ω	5%	0,06W
3581 ©	3198 021 31210	120Ω	5%	0,06W
3582 ©	3198 021 31030	10kΩ	5%	0,06W
3583 ©	3198 021 31210	120Ω	5%	0,06W
3584 ©	3198 021 34720	4,7kΩ	5%	0,06W
3585 ©	3198 021 31210	120Ω	5%	0,06W
3586 ©	3198 021 34710	470Ω	5%	0,06W
3587 ©	3198 021 34710	470Ω	5%	0,06W
3588	3198 011 03910	390Ω	5%	0,16W
3589 ©	3198 021 33910	390Ω	5%	0,06W
3591 ©	3198 021 31030	10kΩ	5%	0,06W
3592 ©	3198 021 31030	10kΩ	5%	0,06W
3593	3198 011 01820	1,8kΩ	5%	0,16W
3594 ©	3198 021 35610	560Ω	5%	0,06W
3596 ©	3198 021 38210	820Ω	5%	0,06W
3598 ©	3198 021 31220	1,2kΩ	5%	0,06W
3599 ©	3198 021 31530	15kΩ	5%	0,06W
3600 ©	3198 021 31530	15kΩ	5%	0,06W
3601 ©	3198 021 31530	15kΩ	5%	0,06W
3604 ©	3198 021 31530	15kΩ	5%	0,06W
3611 ©	3198 021 31510	150Ω	5%	0,06W
3613 ©	3198 021 31510	150Ω	5%	0,06W
3650 ©	3198 021 32720	2,7kΩ	5%	0,06W
3651 ©	3198 021 32210	220Ω	5%	0,06W
3652 ©	3198 021 32710	270Ω	5%	0,06W
3653 ©	3198 021 33910	390Ω	5%	0,06W
3654 ©	3198 021 35610	560Ω	5%	0,06W
3655 ©	3198 021 38210	820Ω	5%	0,06W
3656 ©	3198 021 31220	1,2kΩ	5%	0,06W
3657 ©	3198 021 36840	680kΩ	5%	0,06W
3658 ©	3198 021 31050	1MΩ	5%	0,06W
3659 ©	3198 021 31050	1MΩ	5%	0,06W
3660 ©	3198 021 31030	10kΩ	5%	0,06W
3661 ©	3198 021 31510	150Ω	5%	0,06W
3662 ©	3198 021 32720	2,7kΩ	5%	0,06W
3663 ©	3198 021 31510	150Ω	5%	0,06W
3698 ©	3198 021 33310	330Ω	5%	0,06W
3699 ©	3198 021 33310	330Ω	5%	0,06W
3700 ©	3198 021 31810	180Ω	5%	0,06W
3701 ©	3198 021 32210	220Ω	5%	0,06W
3710 ©	3198 021 34710	470Ω	5%	0,06W
3711 ©	3198 021 34710	470Ω	5%	0,06W
4401 ©	3198 021 90030	CHIP JUMPER 0603		
4402 ©	3198 021 90030	CHIP JUMPER 0603		
4403 ©	3198 021 90030	CHIP JUMPER 0603		
4404 ©	3198 021 90030	CHIP JUMPER 0603		
4405 ©	3198 021 90030	CHIP JUMPER 0603		
4406 ©	3198 021 90030	CHIP JUMPER 0603		
4407 ©	3198 021 90030	CHIP JUMPER 0603		
4408 ©	3198 021 90030	CHIP JUMPER 0603		
4409 ©	3198 021 90030	CHIP JUMPER 0603		
4410 ©	3198 021 90030	CHIP JUMPER 0603		
4411 ©	3198 021 90030	CHIP JUMPER 0603		
4412 ©	3198 021 90030	CHIP JUMPER 0603		
4413 ©	3198 021 90030	CHIP JUMPER 0603		
4414 ©	3198 021 90030	CHIP JUMPER 0603		

RESISTORS

4415 ©	3198 021 90030	CHIP JUMPER 0603
4416 ©	3198 021 90030	CHIP JUMPER 0603
4418 ©	3198 021 90030	CHIP JUMPER 0603
4419 ©	3198 021 90030	CHIP JUMPER 0603
4420 ©	3198 021 90030	CHIP JUMPER 0603
4421 ©	3198 021 90030	CHIP JUMPER 0603
4422 ©	3198 021 90030	CHIP JUMPER 0603
4423 ©	3198 021 90030	CHIP JUMPER 0603
4424 ©	3198 021 90030	CHIP JUMPER 0603
4425 ©	3198 021 90030	CHIP JUMPER 0603
4426 ©	3198 021 90030	CHIP JUMPER 0603
4427 ©	3198 021 90030	CHIP JUMPER 0603
4428 ©	3198 021 90030	CHIP JUMPER 0603
4429 ©	3198 021 90030	CHIP JUMPER 0603
4430 ©	3198 021 90030	CHIP JUMPER 0603
4431 ©	3198 021 90030	CHIP JUMPER 0603
4432 ©	3198 021 90030	CHIP JUMPER 0603
4433 ©	3198 021 90030	CHIP JUMPER 0603
4434 ©	3198 021 90030	CHIP JUMPER 0603
4435 ©	3198 021 90030	CHIP JUMPER 0603
4436 ©	3198 021 90030	CHIP JUMPER 0603
4437 ©	3198 021 90030	CHIP JUMPER 0603
4438 ©	3198 021 90030	CHIP JUMPER 0603
4439 ©	3198 021 90030	CHIP JUMPER 0603
4441 ©	3198 021 90030	CHIP JUMPER 0603
4442 ©	3198 021 90030	CHIP JUMPER 0603
4443 ©	3198 021 90030	CHIP JUMPER 0603
4444 ©	3198 021 90030	CHIP JUMPER 0603
4445 ©	3198 021 90030	CHIP JUMPER 0603
4446 ©	3198 021 90030	CHIP JUMPER 0603
4499 ©	3198 021 90030	CHIP JUMPER 0603

COILS

1401	5322 242 73686	CERAMIC RESONATOR, 12MHZ	
1402	2422 543 00381	CRYSTAL 32,768kHz	
1407	2422 543 01254	XTAL 4,332MHz	for /22 only
5400	2422 535 94686	2,7µH	
5401	2422 535 94686	2,7µH	
5402	2422 535 94686	2,7µH	
5403	2422 535 94686	2,7µH	
5404	2422 535 94686	2,7µH	
5405	2422 535 94686	2,7µH	
5406	2422 535 94686	2,7µH	
5420	2422 535 94686	2,7µH	
5421	2422 535 94686	2,7µH	

DIODES

6400	4822 130 34173	BZX79-B5V6
6401	9322 179 76676	LTL-816EELC, LED red
6406	4822 130 31878	1N4003G
6408	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6411 ©	9340 260 20115	BAW56W
6412 ©	9340 260 20115	BAW56W
6413 ©	9340 260 20115	BAW56W
6414 ©	9340 260 20115	BAW56W
6415 ©	9340 260 20115	BAW56W
6420 ©	3198 020 55680	BZX384-C5V6
6450	4822 130 30621	1N4148
6451 ©	9322 147 85685	LST770-KL, LED RED
6452 ©	9322 147 85685	LST770-KL, LED RED
6453 ©	9322 147 85685	LST770-KL, LED RED
6454 ©	9322 147 85685	LST770-KL, RED

ELECTRICAL PARTSLIST *FRONT BOARD*

DIODES

6460©	9322 204 64685	LBT676-K2M1-1, LED BLUE
6461©	9322 204 64685	LBT676-K2M1-1, LED BLUE
6462©	9322 204 64685	LBT676-K2M1-1, LED BLUE
6463©	9322 179 56685	LBT776-K2M1-1, LED BLUE

TRANSISTORS

7400©	5322 130 60159	BC846B
7401©	5322 130 60159	BC846B
7404©	3198 010 42310	BC847BW
7408©	3198 010 42310	BC847BW
7410	4822 130 40855	BC337-40
7450©	9340 217 80115	BC847CW
7452©	9340 217 80115	BC847CW

INTEGRATED CIRCUITS

7403©	9965 000 25714	TMP88PU77ZF, µP (OTP)
7405	9322 185 95667	IR-RECEIVER, TSOP4836
7406	4822 209 17226	M24C08-WMN6, EEPROM
7407©	9352 686 05118	SAA6581T, RDS DECODER IC for /22 only
7451©	4822 209 15449	74HC4094D, SHIFT REGISTER

Note:
Components printed in grey colour are considered as standard spareparts and thus not available on service stock.
Code numbers are published for orientation only.

ELECTRICAL PARTSLIST *TUNER BOARD ECO6 CENELEC*

MISCELLANEOUS

1101	2422 015 19376	SOCKET CLICKFIT 2P	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR, 2 POLE	
1110	2422 542 90071	FM FRONTEND	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2102©	4822 126 13838	100nF	10%	50V	not USA
2105©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00204	TRIMCAP. 4,2 - 20pF, N750			LW only
2106	2020 800 00191	TRIMCAP. 3 - 11pF, N450			FM/AM only
2107	4822 121 51319	1µF	20%	50V	
2108©	5322 122 32531	100pF	5%	50V	LW only
2109©	5322 122 32448	10pF	5%	50V	LW only
2120©	4822 126 13689	18pF	1%	63V	FM/AM only
2120©	5322 122 32658	22pF	5%	50V	LW only
2122©	4822 122 33891	3,3nF	10%	63V	LW only
2123©	2020 552 93494	390pF	1%	50V	LW only
2124©	4822 122 33177	10nF	20%	50V	FM/AM only
2125©	2020 552 96199	560pF	1%	50V	
2127©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130©	5322 122 32654	22nF	10%	63V	
2131©	4822 126 13482	470nF	20%	16V	
2132©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134©	3198 017 31530	15nF	10%	50V	not USA
2134©	5322 122 32654	22nF	10%	63V	USA only
2135©	3198 017 31530	15nF	10%	50V	not USA
2135©	3198 017 32230	22nF	10%	25V	USA only
2136©	4822 126 14076	220nF	20%	25V	
2137©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139©	4822 126 14236	15pF	5%	50V	
2140©	4822 126 13695	82pF	1%	63V	
2141©	4822 126 13838	100nF	10%	50V	
2143©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145©	4822 122 33575	220pF	5%	50V	
2146©	4822 122 33575	220pF	5%	50V	
2147©	4822 122 33575	220pF	5%	50V	
2148©	4822 122 33127	2,2nF	10%	63V	
2149©	5322 122 32659	33pF	5%	50V	RDS only
2150©	4822 126 13838	100nF	10%	50V	
2159©	5322 122 31151	22µF	20%	50V	
2163©	4822 126 13838	100nF	10%	50V	LW only
2164©	4822 126 13482	470nF	20%	16V	
2165©	4822 126 13838	100nF	10%	50V	
2166©	5322 122 31647	1nF	10%	63V	
2167©	4822 122 33926	12pF	5%	50V	
2169©	4822 122 33127	2,2nF	10%	63V	RDS only
2180©	3198 017 31030	10nF	10%	50V	
2190©	4822 126 13838	100nF	10%	50V	
2191	4822 124 40178	100µF	20%	10V	

RESISTORS

3105©	4822 117 11503	220Ω	5%	0,1W	
3108©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3109©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3123©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3125©	4822 117 10833	10kΩ	1%	0,1W	LW only
3128©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3130©	3198 021 38210	820Ω	5%	0,06W	
3131©	3198 021 38210	820Ω	5%	0,06W	
3132©	4822 051 20479	47Ω	5%	0,1W	
3134©	4822 051 20223	22kΩ	5%	0,1W	
3135©	3198 021 31020	1kΩ	5%	0,06W	
3137©	4822 051 20223	22kΩ	5%	0,1W	LW only
3141©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143©	4822 051 20223	22kΩ	5%	0,1W	RDS only

ELECTRICAL PARTSLIST *TUNER BOARD ECO6 CENELEC*

RESISTORS

3144©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146©	4822 051 20229	22Ω	5%	0,1W	
3150©	4822 117 10833	10kΩ	1%	0,1W	
3151©	4822 051 20683	68kΩ	5%	0,1W	
3152©	4822 051 20471	470Ω	5%	0,1W	
3153©	4822 051 20471	470Ω	5%	0,1W	
3154©	4822 117 13577	330Ω	1%	0,1W	
3155©	4822 117 10353	150Ω	5%	0,1W	
3156©	4822 117 10837	100kΩ	1%	0,1W	
3157©	4822 117 10837	100kΩ	1%	0,1W	
3158©	4822 051 20471	470Ω	5%	0,1W	
3159©	4822 051 20471	470Ω	5%	0,1W	
3160©	4822 051 20471	470Ω	5%	0,1W	
3161©	4822 051 20223	22kΩ	5%	0,1W	
3167©	4822 051 20121	120Ω	5%	0,1W	
3168©	4822 051 20121	120Ω	5%	0,1W	
3169©	4822 051 20154	150kΩ	5%	0,1W	
3170©	4822 117 10837	100kΩ	1%	0,1W	
3171©	4822 117 10834	47kΩ	1%	0,1W	
3172©	4822 051 20562	5,6kΩ	5%	0,1W	
3176©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3180©	4822 117 10833	10kΩ	1%	0,1W	LW only
3190©	4822 051 20121	120Ω	5%	0,1W	
3191©	4822 051 20121	120Ω	5%	0,1W	
3192©	4822 117 13577	330Ω	1%	0,1W	
3193©	4822 117 13577	330Ω	1%	0,1W	
3194©	4822 117 11449	2,2kΩ	1%	0,1W	
3195©	4822 051 20101	100Ω	5%	0,1W	
4101©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4102©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4104©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4105©	4822 051 20008	CHIP JUMPER 0805			
4106©	4822 051 20008	CHIP JUMPER 0805			
4107©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW	
5103	2422 549 44107	RF-COIL LW	LW only
5109	4822 157 71639	FM-IF FILTER 10,7MHz	
5110	4822 242 70665	FM-IF FILTER 10,7MHz	
5111	2422 549 44023	AM-IF FILTER 450kHz	
5112	4822 157 70302	AM-IF FILTER 450kHz	
5114	4822 157 70302	AM-IF FILTER 450kHz	
5115	4822 157 71636	ANTI BIRDY FILTER	
5118©	2422 535 95881	100nH	
5119	4822 157 11443	DISCRIMINATOR COIL	
5121	4822 242 10261	QUARTZ 75kHz	
5122	2422 549 44108	RF-COIL, LW-OSCILLATOR	LW only
5123	2422 549 44108	RF-COIL, MW-OSCILLATOR	

DIODES

6105©	4822 130 83075	HN1V02H
6106©	4822 130 83757	BAS216
6107©	9340 386 90115	BZX284-C11
6120©	4822 130 83757	BAS216

TRANSISTORS

7103©	5322 130 42756	BC857C	RDS only
7104	9322 003 64676	TBC337-40	LW only
7105	9322 003 64676	TBC337-40	LW only
7109©	4822 130 60373	BC856B	LW only
7110©	4822 130 60373	BC856B	
7111©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	
7122©	5322 130 42755	BC847C	LW only
7124©	5322 130 42755	BC847C	LW only

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC

Note:
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Code numbers are published for orientation only.

ELECTRICAL PARTSLIST *TUNER BOARD ECO6 non-CENELEC*

MISCELLANEOUS

1101	2422 015 19376	SOCKET 2P CLICKFIT	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR 2 POLE	
1120	**4822 265 11515**	**FFC SOCKET, 8P**	

CAPACITORS

2101©	4822 126 13692	47pF	1%	63V	
2102©	4822 126 13838	100nF	10%	50V	not USA
2103©	5322 122 31647	1nF	10%	63V	
2104©	5322 122 32531	100pF	5%	50V	
2105©	4822 126 13838	100nF	10%	50V	USA only
2106	**2020 800 00191**	**3-11pF TRIMCAP.,N450**			
2107	4822 121 51319	1µF	20%	50V	
2120©	4822 126 13689	18pF	1%	63V	
2124©	5322 122 32654	22nF	10%	63V	
2125©	2020 552 96199	560pF	1%	50V	
2126©	5322 122 31863	330pF	5%	50V	
2127©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130©	5322 122 32654	22nF	10%	63V	
2131©	4822 126 13482	470nF	20%	16V	
2132©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134©	4822 126 13188	15nF	5%	63V	not USA
2134©	5322 122 32654	22nF	10%	63V	USA only
2135©	4822 126 13188	15nF	5%	63V	not USA
2135©	5322 122 32654	22nF	10%	63V	USA only
2136©	4822 126 14076	220nF	20%	25V	
2137©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139©	4822 126 14236	15pF	5%	50V	
2140©	4822 126 13695	82pF	1%	63V	
2141©	4822 126 13838	100nF	10%	50V	
2143©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145©	4822 122 33575	220pF	5%	50V	
2146©	4822 122 33575	220pF	5%	50V	
2147©	4822 122 33575	220pF	5%	50V	
2148©	4822 122 33127	2,2nF	10%	63V	
2149©	5322 122 32659	33pF	5%	50V	RDS only
2150©	4822 126 13838	100nF	10%	50V	
2152©	4822 126 12105	33nF	5%	63V	not for East Europe
2152©	5322 116 80853	560pF	5%	63V	for East Europe only
2153©	4822 126 13486	15pF	2%	63V	not for East Europe
2153©	4822 122 33926	12pF	2%	50V	for East Europe only
2155	**2020 800 00191**	**3-11pF TRIMCAP.,N450**			
2159©	5322 122 32659	33pF	5%	50V	
2164©	4822 126 13482	470nF	20%	16V	
2165©	4822 126 13838	100nF	10%	50V	
2166©	5322 122 31647	1nF	10%	63V	
2167©	4822 122 33926	12pF	5%	50V	
2169©	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101©	4822 051 20333	33kΩ	5%	0,1W	
3102©	4822 117 10837	100kΩ	1%	0,1W	
3103©	4822 051 20822	8,2kΩ	5%	0,1W	
3104©	4822 117 13577	330Ω	1%	0,1W	
3105©	4822 117 11503	220Ω	5%	0,1W	
3132©	4822 051 20479	47Ω	5%	0,1W	
3134©	4822 051 20223	22kΩ	5%	0,1W	
3141©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146©	4822 051 20229	22Ω	5%	0,1W	
3152©	4822 051 20471	470Ω	5%	0,1W	
3153©	4822 051 20471	470Ω	5%	0,1W	
3154©	4822 117 13577	330Ω	1%	0,1W	
3155©	4822 117 11503	220Ω	5%	0,1W	
3156©	4822 117 10837	100kΩ	1%	0,1W	
3157©	4822 117 10837	100kΩ	1%	0,1W	
3158©	4822 051 20471	470Ω	5%	0,1W	
3159©	4822 051 20471	470Ω	5%	0,1W	
3160©	4822 051 20471	470Ω	5%	0,1W	
3161©	4822 051 20223	22kΩ	5%	0,1W	
3167©	4822 051 20121	120Ω	5%	0,1W	
3168©	4822 051 20121	120Ω	5%	0,1W	
3169©	4822 051 20154	150kΩ	5%	0,1W	
3170©	4822 117 10837	100kΩ	1%	0,1W	
3172©	4822 051 20562	5,6kΩ	5%	0,1W	
3176©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3181©	4822 051 10102	1kΩ	2%	0,25W	
4103©	4822 051 20008	CHIP JUMPER 0805			
4106©	4822 051 20008	CHIP JUMPER 0805			
4107©	4822 051 20008	CHIP JUMPER 0805			
4108©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	**4822 157 71634**	**RF-COIL MW**
5109	**4822 242 70665**	**FM-IF FILTER 10,7MHz**
5110	**4822 242 70665**	**FM-IF FILTER 10,7MHz**
5111	**2422 549 44023**	**AM-IF FILTER 450kHz**
5112	**4822 157 70302**	**AM-IF FILTER 450kHz**
5114	**4822 157 70302**	**AM-IF FILTER 450kHz**
5119	**4822 157 11443**	**DISCRIMINATOR COIL**
5121	**4822 242 10261**	**QUARTZ 75kHz**
5123	**2422 549 44108**	**RF-COIL, AM-OSCILLATOR**
5130	**4822 157 11843**	**RF COIL 1,5 TURNS**
5131	**4822 157 11843**	**RF COIL 1,5 TURNS**

DIODES

6103©	5322 130 34337	BAV99
6105©	4822 130 83075	HN1V02H
6106©	4822 130 83757	BAS216
6107©	9340 386 90115	BZX284-C11
6120©	4822 130 83757	BAS216
6130©	4822 130 82833	1SV228
6131©	4822 130 82833	1SV228

TRANSISTORS

7102	**4822 130 42131**	**BF550**	
7103©	**5322 130 42756**	**BC857C**	RDS only
7111©	**5322 130 42755**	**BC847C**	
7112	**4822 130 44503**	**BC547C**	

INTEGRATED CIRCUITS

7101©	**9351 740 80557**	**TEA5757H/V1, RADIO IC**

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